Province of British Columbia

Ministry of
Energy, Mines a
Petroleum Re rces

SELECTED PUBLICATIONS

OF THE

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INTRODUCTION

The Ministry of Energy, Mines and Petroleum Resources has a number of series of publications, maps, and available files. Since 1874 Annual Reports of the Minister of Mines have been issued. Geological and technical reports related to the mineral industry have been issued since 1969 in a separate publication, *Geology, Exploration and Mining in British Columbia.* Another series of publications, called *Bulletins,* was started in 1940 that are mostly geological reports of greater scientific detail or less topicality than those issued in *Geology, Exploration and Mining in British Columbia.* In 1975, a series called *Papers* was started that includes miscellaneous works on mine safety, reclamation, geology, and resource economics.

Maps issued by the Ministry vary in purpose. One series consists of preliminary maps, mostly geological; others consist of revised mineral inventory maps, mineral deposit/land use maps, assessment report index maps, aeromagnetic maps, and geochemical reconnaissance maps. In addition, a series of maps is issued showing title – mineral and 2 post claims, placer leases, and coal licences.

This abbreviated index is designed to introduce the various publications available and to highlight the most recent publications of interest to explorationists.

HOW TO ORDER

All publications can be purchased over the counter at Publications Distribution, 552 Michigan Street (basement), Victoria [Telephone (604) 387–3188)].

Publications are also available by mail order. We ask that you please prepare your request in writing listing the publications required and mail, together with remittance, to the Publications Distribution Section, Ministry of Energy, Mines and Petroleum Resources, Parliament Buildings, Victoria, B.C. V8V 1X4.

PAYMENT

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BULLETINS

The Bulletin Series started in 1940. The following partial list includes only recent bulletins still available for distribution.

No.		Price $
59	*Geology of Copper Mountain,* by V. A. Preto, 1972	5.00
60	*Geology of the Akolkolex River Area,* by R. I. Thompson, 1979	5.00
61	*Geology of the White Lake Basin,* by B. N. Church, 1973	5.00
62	*Gravity, Magnetics, and Geology of the Guichon Creek Batholith,* by C. A. Ager, W. J. McMillan, and T. J. Ulrych, 1972	5.00
64	*Porphyry Copper and Molybdenum Deposits, West-Central British Columbia,* by N. C. Carter, 1981	10.00
65	*Surficial Geology and Sand and Gravel Deposits of Sunshine Coast, Powell River, and Campbell River Areas,* by J. W. McCammon, 1977	5.00
66	*Berg Porphyry Copper-Molybdenum Deposit,* by Andrejs Panteleyev, 1981	10.00
68	*An Analysis of Distribution of Mineral Occurrences in British Columbia,* by A.J. Sinclair, H.R. Wynne-Edwards, and A. Sutherland Brown, 1978	5.00
69	*Geology of the Nicola Group between Merritt and Princeton,* by V. A. Preto, 1979	5.00
70	*Geology and Mineral Occurrences of the Southern Hogem Batholith,* by J. A. Garnett, 1978	5.00
71	*Geology of the Goldstream Area,* by Trygve Höy, 1979	5.00
73	*Geology of the Riondel Area, Central Kootenay Arc, Southeastern British Columbia,* by Trygve Höy, 1980	5.00
74	*Geological Setting of the Rossland Mining Camp,* by James T. Fyles	5.00

PAPERS

The Paper Series was begun in 1975 and includes publications from all the Branches of the Mineral Resources Division. Only Geological Branch Papers are listed here.

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1976, Paper 1977–1	3.00
1977, Paper 1978–1	Out of print
1978, Paper 1979–1	3.00
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1981, Paper 1982–1	5.00
1982, Paper 1983–1	7.00
1983, Paper 1984–1	8.00
1984, Paper 1985–1	5.00
Miscellaneous Papers:	
1981–2: *Reconnaissance Rock Geochemistry of the Nicola and Kingsvale Groups between Merritt and Princeton,* by V. A. Preto	5.00
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1984–2: *An Overview of the Placer Mining Industry in Atlin Mining Division, 1978 to 1982*	2.00
1984–3: *Geology of the Quinsam Lake Area,* by G.E.P. Eastwood	3.00

ASSESSMENT REPORT SERIES

Reports submitted to the Ministry for assessment credit on properties held under the *Mineral Act* and *Mining (Placer) Act* have been microfilmed and are available for viewing or printing upon expiration of the one-year confidential period.

Assessment report index maps show the locations and numbers of assessment reports. When ordering, indicate desired maps by NTS sheet followed by (AR), for example, 82F/NE (AR). There are 89 maps in this series.

PRICE: $1.00 per sheet

GEOLOGICAL BRANCH, MINERAL RESOURCES DIVISION
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Mineral Inventory maps are available at scales of 1 inch equals 2 miles, 1:150 000, and 1:250 000, and show on a standard topographic map the location of metallic, industrial, coal, and placer occurrences, the name of the property, an identifying number, and the metals or commodities present. A total of approximately 9 000 mineral occurrences are shown on 94 maps.

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Mineral Deposit/Land Use maps portray relative mineral potential probability of mineral discovery and exploration activity. On these interpretative maps, terrain is subdivided into five hierarchical categories on the basis of distribution of deposits in relation to the areal geology and to the estimated mineral potential of the geological environment.

PRICE: $1.00 per sheet

GEOCHEMICAL RECONNAISSANCE MAPS

Maps and statistical data of geochemical reconnaissance surveys have been issued since 1977. Initially, these were part of an equally funded 3-year federal/provincial agreement, the Uranium Reconnaissance Program of the National Geochemical Surveys. NTS map-areas surveyed under this agreement included: 82 E, F, K, L, and M and 104 N, O, and P. In 1978, British Columbia also conducted provincially funded Regional Geochemical Surveys, with data handling and advisory aid from the Geological Survey of Canada. The main difference between the two groups of surveys is that element maps were issued as part of the Uranium Reconnaissance Program, whereas until 1983 data lists and sample location maps comprised the Regional Geochemical Surveys (RGS) release. In 1983, costs of the RGS program were again shared with the Geological Survey of Canada. Therefore at the 1984 data release, element maps were available once more.

MAPS

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56	*Geology of the Adams Plateau–Clearwater Area* (82L/13; 82M/3, 4, 5, 6, 12; 92P/1, 8, 9) (1:100 000), by P. Schiarizza, V. A. Preto, G. P. McLaren, L. J. Diakow, and D. Forster	2.00
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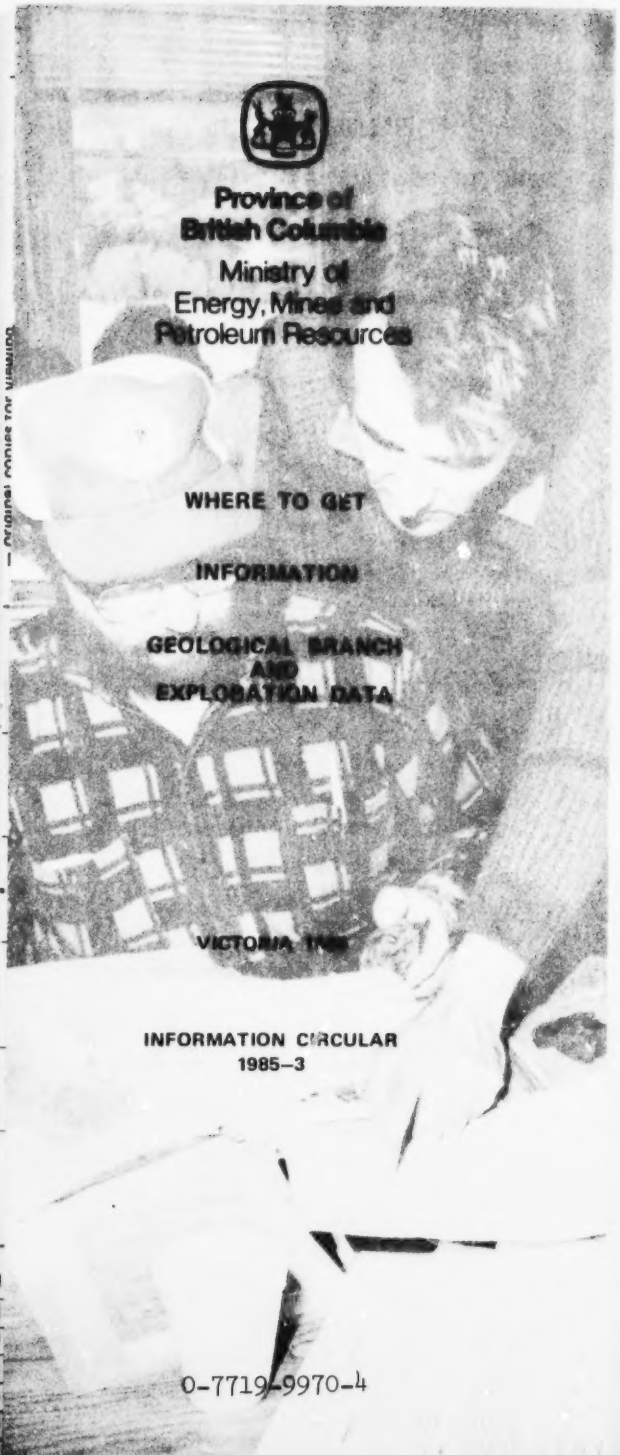

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DATA AVAILABILITY

LOCATION	Mineral Assessment Reports – original copies for viewing	Mineral Assessment Reports – microfilm copies for viewing	Mineral Assessment Reports – photocopying facilities	MINFILE[2] – computer mineral inventory data base consisting of master file commodity index, alphabetical index, custom retrivals – sales of retrievals on paper, fiche, or computer tape formats	MINFILE – for viewing and photocopying	Property files for viewing and photocopying	Coal Assessment Reports – original copies for viewing	Coal Assessment Reports – for photocopying	COALFILE – computer coal exploration data base – sales of custom retrievals and plots	Selected Mineral Resources Division Publications in 1984/85: Summary of Operations, Mineral Resources Division – 1980, 1981, 1982	Geological Setting of the Rossland Mining Camp, Bulletin 74	Geological Fieldwork, 1984, Paper 1985-1	Geology of the Quinsam Lake Area, Paper 1984-3	Exploration in British Columbia, 1980	Assessment Report Index – new edition to December 1984	Mineral Inventory Maps – updated December 1984	Assessment Report Index Maps – updated December 1984	Mineral Deposit/Land Use Maps (mineral potential)	Producing Mines, Mineral Deposits with Reserves, and Significant Coal Deposits of British Columbia	Geology of the Cranbrook Sheet and Sullivan Mine Area (82G/12, 82F/9), Preliminary Map No. 54	Areas Alienated or Restricted from Mining in British Columbia, Preliminary Map No. 55	Geology of the Adams Plateau-Clearwater Area (82L/13, 82M/3, 4, 5, 6, 12, 92P/1, 8, 9) Preliminary Map No. 56	British Columbia Geological Highway Map	Published geological maps, reports, journals, and reference books for viewing
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Fernie	+[1]	+[3]			+[1]		+[1]																	
Fort St. John	+[1]	+[3]			+[1]		+[1]																	

[1] District offices have Assessment Reports and MINFILE (paper) pertaining to their specific districts only.
[2] MINFILE – updated December 1984; major redesign of file in progress.
[3] Partial coverage.

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Province of
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BRITISH COLUMBIA MINERAL EXPLORATION REVIEW 1984

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BRITISH COLUMBIA

EXPLORATION REVIEW 1984

By

Staff, Geological Branch
British Columbia Ministry of Energy, Mines and Petroleum Resources

Information Circular 1985-1
Victoria
British Columbia
January 1985

INTRODUCTION

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During 1984 exploration in British Columbia remained at a high level, approaching that of 1983, and continued to be driven by the search for precious metals. Total mineral claims recorded for the year are estimated at 82,454, 23 percent less than the all-time record of 106,683 set in 1983 (Figures 1 and 2). The number of placer lease applications recorded for the year was 641, a 64 percent drop from the 1983 total of 1,787. However, the number of companies that were active in mineral exploration in the Province, and their expenditures, remained about the same as in 1983, approximately 800 and 50 million respectively, signifying more effort spent on property examination than on land acquisition, in comparison to 1983. (Figure 2).

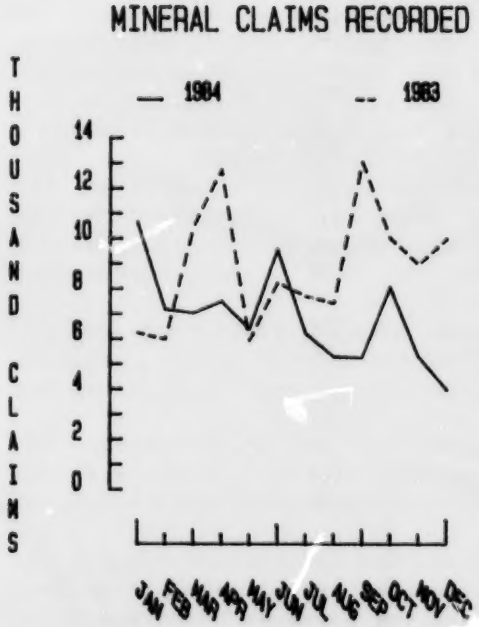

Figure 1. Mineral claims recorded in British Columbia, 1983 and 1984.

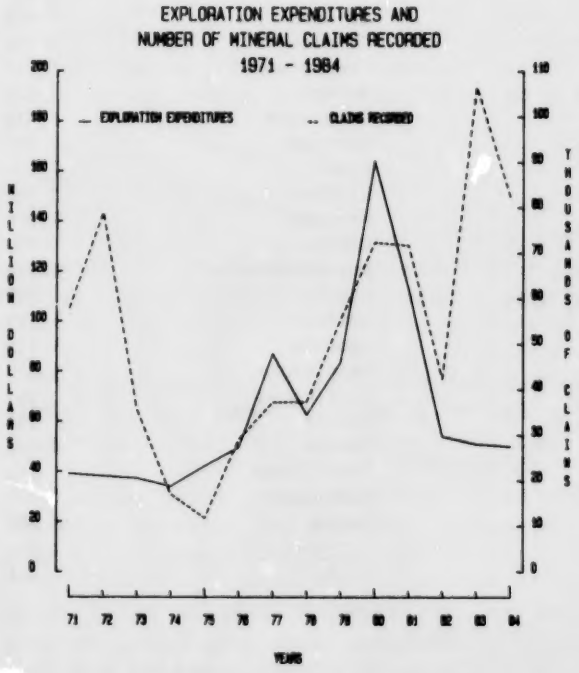

Figure 2. Mineral exploration expenditures and number of mineral claims recorded, 1971-1984.

About $110 million was raised by mineral sector companies on the Vancouver Stock Exchange during the year, as conpared to $134 million in 1983, underlining the importance of Vancouver as a major financial centre for mineral exploration.

Although 223 coal licence applications were received for the year, more than double the 109 received in 1983, coal exploration expenditures are estimated at no more than $4 million, compared to $9 million for 1983. These monies were spent almost entirely on two projects in the northwest, Klappan and Telkwa, and on exploration in the immediate vicinities of operating mines in the northeast and southeast coalfields.

TABLE 1
MINERAL CLAIMS RECORDED 1984

Mining Division	Claims (projected to Dec 30)	Claims per 1 000 km^2
Alberni	7 142	335
Atlin	4 888	68
Cariboo	12 498	90
Clinton	2 242	54
Fort Steele	3 818	174
Golden	1 626	50
Greenwood	1 416	153
Kamloops	7 708	159
Liard	2 881	8
Lillooet	3 995	273
Nanaimo	2 386	86
Nelson	1 781	206
New Westminster	2 932	139
Nicola	925	106
Omineca	5 695	30
Osoyoos	1 133	137
Revelstoke	3 835	242
Similkameen	953	156
Skeena	4 394	25
Slocan	4 044	231
Trail Creek	219	68
Vancouver	1 002	18
Vernon	2 505	198
Victoria	2 446	229
TOTAL	82 464	

In both the metal and coal sector most of the activity was concentrated in the northwest part of the Province. Here the search for precious metal-bearing deposits was highlighted by an aggressive major program by REGIONAL RESOURCES on their MIDWAY property, including 10 892 metres of diamond drilling and a major underground development program begun late in October. Major coal exploration programs were carried out by CROWSNEST RESOURCES LTD. at TELKWA and by GULF CANADA RESOURCES LTD. at MOUNT KLAPPAN. These and other major programs in the northwest and other parts of the Province are outlined in the highlights below.

Producing mines, particularly base metal mines, continued to fare badly in 1984. Continued depressed metal prices and high production costs caused widespread suffering, ensured the continued closure of those operations that were already shutdown, and caused several new closures. In the northwest, GRANDUC MINE closed permanently in June, while BELL COPPER, ENDAKO and KITSAULT mines remain closed indefinitely. MOSQUITO CREEK GOLD MINE near Wells also remains closed indefinitely. In the south-central part of the Province, BRENDA MINES reopened May 28 to close again indefinitely in October. GOLDSTREAM MINE closed in April and HIGHMONT MINE closed in October.

On a brighter note, DENISON'S QUINTETTE and TECK'S BULLMOOSE mines were officially opened in June, although these two large operations had been shipping coal since December 1983. FORDING COAL'S EAGLE MOUNTAIN operation was officially opened in April. In the Empire Valley area west of the Fraser River, AURUN'S MINE perlite quarry opened at an initial rate of 2 000 tonnes per year.

Some particularly significant exploration programs for 1984 are:

1) The MIDWAY carbonate-shale hosted silver-zinc-lead deposit of REGIONAL RESOURCES LTD. continued to be the object of the largest exploration program in the Province. Reserves were substantially increased and grade slightly improved.

2) The HEART PEAKS precious metal prospect was the object of a substantial drilling program by KERR ADDISON MINES LTD. and NEWMONT MINES LTD. which tested three of five known zones of predominantly silver mineralization.

3) CHEVRON CANADA LTD. carried out a major drill program in the TATSAMENIE LAKE area as well as regional exploration pursuing at least two zones of "no-seeum" gold mineralization.

4) A major surface and underground drilling program by SEREM LTD. on their LAWYERS property in the Toodoggone River area, more than doubled drill-indicated reserves and brought this property to the feasibility study and production decision stage.

5) A substantial drilling and trenching program by KIDD CREEK MINES LTD. on the AL property, also in the Toodoggone, outlined several small zones of high-grade but erratic epithermal gold mineralization.

6) Substantial drilling by NEWMONT EXPLORATION OF CANADA LTD. on the SHAS property, also in the Toodoggone, tested one of three known zones of base metal-gold stockwork type mineralization.

7) A similar drilling program, also by NEWMONT, on another Toodoggone property, the GOLDEN LION, tested three zones of silver-gold mineralization along a strike length of 1.5 kilometres.

8) ANACONDA CANADA EXPLORATION LTD. carried out a substantial drilling and trenching program on SKYLINE's precious-base metal property in the Iskut River area.

9) WESTMIN RESOURCES LTD. continued testing and fill-in drilling on their BIG MISSOURI and SILBAK PREMIER precious-base metal prospects near Stewart.

10) TRADER RESOURCES CORP. completed a major drilling program on the YELLOW GIANT gold prospect on Banks Island, testing both bulk-tonnage and lode type gold mineralization.

11) TECK CORPORATION carried out a substantial drilling program on GROUSE MOUNTAIN near Smithers testing six base metal zones.

12) EQUITY SILVER MINES LTD. carried out major drilling programs on the Waterline and Superstition zones near their operation, south of Houston.

13) CROWSNEST RESOURCES LTD. completed a major drilling program on their TELKWA property outlining a large, easily accessible deposit of thermal coal. A Stage Two report is expected early in 1985.

14) GULF CANADA RESOURCES continued to explore by drilling, trenching and bulk sampling their large anthracite deposits on MOUNT KLAPPAN, aiming for an early production decision. A 20 000 tonne trial shipment of anthracite was sold late in the year for test marketing in Europe.

15) DOME MINES LTD. continued testing their QR gold deposit near Quesnel Lake with a substantial drill program.

16) BLACKDOME EXPLORATION LTD. continued to develop their epithermal gold-silver property at BLACKDOME MOUNTAIN with a substantial underground program.

17) QUINTETTE MINES LTD. completed a major drill re-evaluation of their pittable coal reserves between McCONKEY MINE and BABCOCK MTN.

18) FORDING COAL completed a major drilling program to better define their reserves on EAGLE MOUNTAIN.

19) WESTAR MINING also did extensive drilling at BALMER and NATAL RIDGE to better define coal reserves.

20) CROWSNEST RESOURCES completed a similar program on LINE CREEK EXTENSION for much the same purpose.

21) CORPORATION FALCONBRIDGE COPPER completed a program of systematic drilling, trenching, and a variety of surveys on their REA GOLD property west of Adams Lake, outlining two lenses of good grade precious-base metal massive sulphide type mineralization.

22) SELCO-BP continued testing their J&L gold property north of Revelstoke with a substantial underground program.

23) MASCOT GOLD late in the year initiated a major program of drilling and mapping on their Hedley property looking for pittable ore.

24) ESPERANZA EXPLORATION LTD. continued exploration near TILLICUM MOUNTAIN and have outlined zones of significant silver mineralization at SILVER QUEEN.

25) CORPORATION FALCONBRIDGE COPPER continued mapping and drilling on MT. SICKER on Vancouver Island, with favourable results.

26) ABO OIL CORPORATION outlined what appears to be a substantial zone of pittable low-grade gold mineralization at the RN mine near Harrison Lake.

This report on exploration is arranged according to activity in each of the seven District Geologists' areas. A separate section is devoted to industrial mineral exploration. A short summary of field activities and major planning programs in aid of exploration by the Ministry's Geological Branch is also included. Mineral claim and exploration expenditure statistics were supplied by the Ministry's Titles Branch and by the B.C. and Yukon Chamber of Mines. V.A. Preto, who wrote the introduction, and compiled and edited the report, gratefully acknowledges the cooperation of these agencies and individuals.

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INTRODUCTION

The level of mineral exploration, almost entirely devoted to the search for precious metal-bearing deposits, was up approximately 70 percent from 1983 and up approximately 50 percent from 1982. Coal exploration continued at an aggressive pace in the Telkwa, Klappan, and Sustut coal fields. Diamond drill programs, totalling over 50, were up 43 percent from 1983 and up 70 percent from 1982. Grassroots prospecting continued to be at a very low ebb. Major exploration programs for precious metals took place in the TOODOGGONE, STEWART, CASSIAR, TATSAMENIE LAKE and BANKS ISLAND AREAS and for massive sulphides in the TSIRKU-MT. HENRY CLAY and MIDWAY areas.

EXPLORATION

Minerals

In the extreme northwest, STRYKER and FREEPORT RESOURCES LTD. explored a 900 unit group of claims in the TSIRKU-JARVIS GLACIER AREA (1) (Figure 3) where they had located numerous stratiform sulphide showings with some similarities to the Windy-Craggy massive sulphide deposit located some 75 kilometres to the northwest. Nearby on Mt. McDonell NORANDA EXPLORATION LTD. completed 132.3 metres of drilling in four holes testing a vein gold prospect. On the Alaska side of the border, BEAR CREEK MINING COMPANY LTD. diamond drilled an area on the north slope of Mount Henry Clay in an attempt to locate the source of impressive massive sulphide boulders.

In the Atlin area, small diamond drill programs were carried out on the SHUKSAN and GV properties (2) by STANDARD GOLD MINES LTD. and CLAYMORE RESOURCES LTD. respectively, in the search for lode gold mineralization near the headwaters of major placer gold producing creeks in the historic Atlin placer camp.

The MIDWAY massive sulphide carbonate-shale hosted property (3) located approximately 120 kilometres west of Watson Lake, was further explored in 1984 by REGIONAL RESOURCES LTD. with 49 drill holes totalling 10 892 metres. Thus since 1981, 102 drill holes totalling 28 767 metres have been completed. A major underground development program, including a 427 metre decline, began in October to determine mining and other characteristics of the small but high grade silver-zinc-lead deposit known as the Silver Creek Zone. Combined with the previously discovered and well known Discovery Zone, geological reserves for the two zones are estimated at 6 047 794 tonnes grading 403.8 grams of silver per tonne, 11.90 percent zinc and 6.70 percent lead. Two high grade sections have been isolated at Silver Creek

containing a total of 1 331 805 tonnes grading 664.3 grams of silver per tonne, 12.8 percent lead and 12.3 percent zinc. The Silver Creek Zone was chosen instead of the Discovery Zone for the current underground program on the basis of better access, greater thicknesses, and overall grade. Consultants hired by REGIONAL believe the deposits are chimney, manto-type occurrences controlled by structure. Several other companies are active in the Midway area.

PHOTO 1 - Midway (Ag, Zn, Pb) deposit looking easterly - Silver Creek Zone at centre-left. Drill indicated reserves 6 047 794 tonnes grading 463.8 grams of silver per tonne, 11.90 percent zinc, 6.70 percent lead.

In the CASSIAR area, gold exploration and development continued at ERICKSON GOLD MINE (4) which maintained production at a rate of 254 tonnes per day with mill heads averaging slightly below 15 grams of gold per tonne. On the surface along the Vollaug Vein (ex-PLAZA ground), ERICKSON GOLD MINES LTD. mined ore from five open cuts as well as from underground via the adit established by Silver Standard Mines. Approximately 40 000 tonnes of ore averaging 10.3 grams per tonne was stockpiled at the mill. Underground development work continued on the lowest level, the 14 Level. Current reserves are estimated at 174 600 tonnes grading 13.7 grams of gold per tonne.

The KUTCHO CREEK massive sulphide deposit (5) was further explored by ESSO MINERALS CANADA who re-examined and re-logged previous drill core and by SUMAC MINES LTD. who completed field data collection for Stage II environmental studies and conducted soil engineering studies in anticipation of a feasibility study. Estimated reserves remain at 17 million tonnes grading 1.62 percent copper, 2.3 percent zinc, 0.06 percent lead, 29.2 grams of silver per tonne, and 0.3 grams of gold per tonne.

On the HEART PEAKS precious metal prospect (6), located 117 kilometres west of Dease Lake, KERR ADDISON MINES LTD., under a joint venture agreement with NEWMONT MINES LTD., drilled eight holes totalling 1 972.3 metres testing three zones of mineralization (Top, Quartz Hill and Steep). Anomalous gold, silver, arsenic, antimony and mercury values exist in association with quartz veining in silicified and pyritized trachyte and trachyte breccias of Plio-Pleistocene age. At least five zones of predominantly silver mineralization occur along a NNE-trending zone which may represent a prior zone of structural weakness.

In the TATSAMENIE LAKE area, located approximately 140 kilometres south west of Dease Lake, CHEVRON CANADA LTD. carried out a significnt drill program on

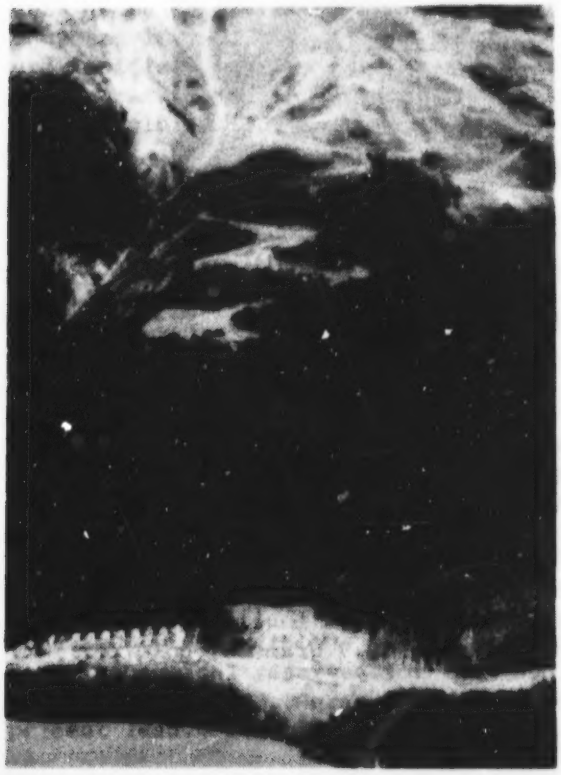


PHOTO 2 - Muddy Lake (Au) property, looking north over Bear Main Zone. Lake and Chevron Canada Resources camp at bottom.

their MUDDY LAKE precious metal property (7), as well as a large regional exploration program. During 1984, 56 diamond drill holes totalling approximately 10,000 metres, using three to four drills, tested a major NNW-trending fault structure which has been traced over a one kilometre length. Significant "no-seeum" gold with minor silver mineralization is associated with silicified and brecciated rocks at the contact between clean Permian limestones and pre-Upper Triassic pelagic sediments with mafic volcanic rocks. Two major alteration types are recognized: a dolomite-quartz assemblage and quartz-Fe-carbonate-pyrite assemblage with occasional fuchsite. Two 'zones' of mineralization are being tested, the most significant one being the Bear Main Zone where mineralization has been traced over a length of approximately 110 metres, and a width of ten metres.

In the TOODOGGONE gold-silver camp, no less than seven major diamond drill programs were carried out as well as lesser programs. SEREM INC. completed a total of 7 010.4 metres of surface and underground drilling in 45 holes on their LAWYERS (8) gold-silver property. Underground drilling consisting of 13 holes on the Amethyst Gold Breccia Zone (previously estimated reserves of 639 813 tonnes grading 7.27 grams of gold per tonne and 254.2 grams of silver per tonne) confirmed the existence of the West Zone in the hangingwall sequence. Surface diamond drilling of 19 holes on the Cliff Creek Zone and of 13 holes on the Dukes Ridge Zone have resulted in the near doubling of geological reserves to in excess of one million tonnes conservatively grading at 7.27 grams of gold per tonne and 254.2 grams of silver per tonne. Company officials estimate that to date only 20 percent of known surface structures on the Lawyers property have been tested. A comprehensive feasibility study is scheduled to be carried out during the winter and a production decision may follow shortly thereafter. KIDD CREEK MINES LTD. completed 1 211 metres of surface diamond drilling in 17 holes on the Verrenass, Thesis II, Thesis III, and BV Zones on the Al property (9). Approximately 40 backhoe trenches, totalling 2 012 lineal metres were also completed, mostly on the Thesis III and BV Zones. Most mineralized zones (more than six) on the Al property consist of structurally controlled, barite-gold or silica-hematite-gold mineralized alteration zones which represent a high level of Au-Ag deposition in an epithermal system. Several narrow but high grade gold intersections were encountered. On their JD property, KIDD CREEK MINES LTD. also completed 330 metres of surface diamond drilling in seven holes on the Gasp and Gumbo Zones, and five backhoe trenches totalling 130 metres on the Woof Zone. Gold-silver-base metals mineralization with intense silicification and argillization is associated with a shallow dipping thrust fault in Toodoggone volcanics. NEWMONT EXPLORATION OF CANADA LTD. explored two properties in the Toodoggone. On the SHAS gold-silver prospect (11), under option from INTERNATIONAL SHASTA RESOURCES LTD., 2 002.2 metres of diamond drilling in 19 holes, ranging from 33 to 197 metres in length, partially tested a zone (400 X 500 metres) of silicification containing precious and base metals in stockwork style of mineralization in Toodoggone tuffs. Three mineralized zones have been located along a northerly trend and drilling during 1984 concentrated on the

Creek Zone extending the zone of mineralization found during 1983. On the GOLDEN LION silver-gold prospect (12), 2 475 metres of diamond drilling in 22 holes, ranging from 45 to 242 metres in length, tested three zones of mineralization along a northwesterly trending strike length of 1 525 metres. Precious and base metals occur in a structurally complex quartz vein system in silicified Toodoggone volcanics in close proximity to a major fault contact with Takla Group andesites and a synvolcanic intrusion, which also hosts weak stockwork base and precious metals mineralization. DUPONT OF CANADA EXPLORATION LTD., in a joint venture with COMINCO LTD., diamond drilled 1 848.4 metres in nine holes on the BILL gold prospect (13). Several high grade but narrow drill intersections with gold were encountered in structurally controlled quartz-carbonate veinlets within a metamorphic suite of rocks. Other significant programs in the Toodoggone area included a small diamond drill program by ANACONDA CANADA EXPLORATION LTD., under an option agreement with PACIFIC RIDGE RESOURCES CORP., on the RON claims (copper-gold-silver prospect) (14) and a large geophysical, geochemical and surface trenching program by ST. JOE CANADA LTD. on the SILVER POND gold-silver prospect. St. Joe's property abuts on the western boundary of Serem's claims, and the program was primarily designed to test the southwesterly extension of Serem's Cliff Creek breccia Zone.

PHOTO 3 - Lawyers (Au, Ag) deposit, looking north over Amethyst Gold Breccia Zone. Current indicated combined reserves in excess of 1 million tonnes grading 7.27 grams of gold and 254.2 grams of silver per tonne.

In the JOHANSON LAKE Area, three significant programs were completed. LORNEX MINING CORPORATION LTD., under an option agreement with GERLE GOLD LTD., completed 1 528 metres of diamond drilling in 32 reconnaissance, widely spaced holes testing for gold mineralization along a projected eight kilometre shear zone on the GERLE GOLD property (15), located near Fredrickson Lake. The results of the drilling were inconclusive with the best intersection being 7.2 grams of gold per tonne over 4.27 metres, approximately 45.7 metres below surface. SELCO INC. completed 1 004 metres of diamond drilling in seven holes on the RED copper-gold-molybdenum prospect (16). FALCONBRIDGE LTD., under an option agreement with ASITKA/GUNSTEEL RESOURCES CORP., carried out geochemical and geological surveys as a follow-up to regional geochemical anomalies discovered in 1983 on the ASITKA property (17). Target areas included the paleo-placer source of gold anomalies within Cretaceous age Brothers Peak and Tango Creek Formation conglomerates, and shear zones within Takla and Hazelton Group volcanic rocks.

In the ISKUT area, LAC MINERALS LTD. completed 330 metres of drilling in four holes on the HANK claims (18), located just south of Ball Creek. ANACONDA CANADA EXPLORATION LTD., under an option agreement with SKYLINE EXPLORATIONS LTD., completed 1 338.7 metres of drilling in 12 holes and 700 lineal metres of surface trenching on the Cloutier, McFadden Float and Bonanza Zones on the REG precious and base metals prospect (19). Drilling through the Mt. Johnny Glacier in search of the elusive high grade McFadden Float proved unsuccessful. In addition, drilling of four holes on the high grade R-16 Zone by SKYLINE showed that gold-silver-base metal mineralization extends to at least 160 metres below surface. The Cloutier R-16 zones form the most extensive zone extending over a known east-west length of at least 670 metres and include at least six major gold-bearing lenses within a width of about 150 metres (Skyline Progress Report 84-1, October 25/84). SKYLINE EXPLORATIONS LTD. completed 1 631 metres of drilling in 22 holes (10 on the Main Zone and 12 on the Discovery Zone) on the INEL property (20). Preliminary data for the Discovery Zone indicate at least five easterly dipping complex sulphide zones of zinc-silver-gold mineralization associated with a planar stratabound zinc-rich zone cut by younger gold-bearing veins within a 110 metre thick sequence of thin bedded sedimentary and volcanic rocks over a strike length of at least 230 metres and continuous for more than 150 metres down dip.

In the STEWART area, WESTMIN RESOURCES LTD. carried out two major programs. On the BIG MISSOURI precious and base metals prospect (21), a total of 305 metres in six holes were completed on the Dago Zone. The holes were designed to fill in the gaps in the data used to calculate previously released geological reserves of 1 965 900 tonnes grading 3.19 grams of gold per tonne equivalent (1 Au = 42 Ag). On the SILBAK PREMIER precious-base metals prospect (22), a total of 2 421 metres in 23 holes were completed in the vicinity of the upper levels of the old mine, testing for a bulk tonnage silver and gold deposit. Results continue to be encouraging and continued

drilling is anticipated in 1985. Exploration in the area of the former Granduc millsite by ESSO MINERALS CANADA LTD. and SCOTTIE GOLD MINES on the SUMMIT precious metals prospect (23) included 1 091.2 metres of diamond drilling in 20 holes. At the PROSPERITY/PORTER IDAHO silver property (24), PACIFIC CASSIAR LTD. completed 320 metres of diamond drilling in four holes to test core recovery in the 'D' vein. It is anticipated that mineralization encountered will add to known probable reserves on the vein. In addition, two previously unknown veins were cored between the Blind and D Veins. A possible bulk tonnage area was discovered outcropping just south of the southern limits of the vein.

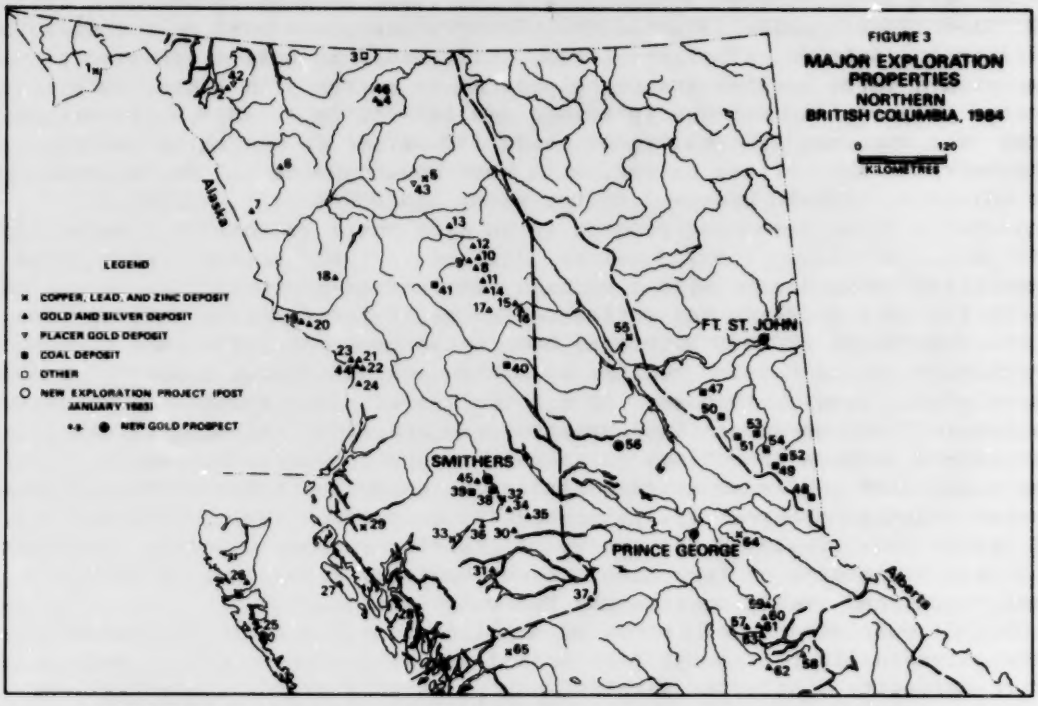
On the QUEEN CHARLOTTE ISLANDS, PLACER DEVELOPMENT LTD. completed five holes totalling 894.7 metres on the APRIL gold-silver prospect (25), located on the northwest part of Lyell Island. The holes tested gold-silver mineralization in predominantly pyritized, fragmental rhyolitic rocks along or in the vicinity of the Beresford fault. On the Y5-Y7 and HOULIE GROUPS (26), PROCAN EXPLORATION COMPANY completed percussion drilling totalling 1 646 metres in 36 holes on the former and 412 metres in nine holes on the latter. The drilling, which tested geochemical/geological targets in areas underlain by Yakoun and possible Masset volcanics, did not encounter any gold values of immediate economic significance.

On BANKS ISLAND, TRADER RESOURCE CORP. completed 3 575.3 metres of diamond drilling on its YELLOW GIANT gold property (27) wherein 10 gold deposits have been found within a 2 960 hectare area. Bulk tonnage, disseminated gold deposits (Kim Zone) occur in highly fractured granitic rocks, while high grade gold lodes (Discovery, Tel and Bob Zones) occur in metasedimentary rocks and associated skarns. Ore reserves previously estimated for the Discovery Zone are 99 700 tonnes grading 15.75 grams of gold per tonne. Recently calculated reserves for the Kim Zone are estimated at 997 700 tonnes grading 2.5 grams of gold per tonne, including a Central Zone of 385 475 tonnes grading 3.6 grams of gold per tonne. During 1984 TRADER tested the Englishman, Discovery, Bob and Kim Zones in an effort to confirm and expand reserves. Deep drilling on gold stockworking on the Discovery Deposit has proven that the sedimentary rocks and fault structure which host the deposit continue to depths greater than 350 metres.

On the HUNTER gold prospect (28), located 100 kilometres south of Kitimat, ARNHEM RESOURCES INC. completed 731 metres in seven holes in an effort to test the down-dip extension of the River Vein. Six occurrences of gold-bearing quartz-pyrite vein deposits are known to be contained within a roof pendant of metavolcanic rocks in a stock of quartz monzonite. A 1980 reserve estimate was 94 328 tonnes grading 12 grams of gold per tonne.

On the SCOTIA high grade zinc prospect (29), located 70 kilometres ESE of Prince Rupert, ANDAUREX RESOURCES INC., under an option agreement with KIDD CREEK MINES LTD., completed 11 drill holes totalling 771.5 metres.

The holes were designed to test lensoid and poddy mineralization at depth and along a strike length of 214 metres. Reserves (1980) were estimated at 150 000 tonnes grading 13.3 percent zinc, 1.4 percent lead and 25 grams of silver per tonne.



1. TSIRKU–JARVIS GLACIER (Mt. Henry Clay) (Cu, Ag, Au, Co, Zn)
2. SHUSKAN, QV (Au, Ag)
3. MIDWAY (Ag, Pb, Zn)
4. ERICKSON GOLD (Au, Ag)
5. KUTCHO CREEK (Cu, Zn, Ag)
6. HEART PEAKS (Ag, Au)
7. MUDDY LAKE (Au, Ag)
8. LAWYERS (Au, Ag)
9. AL (Au, Ag)
10. JD (Au, Ag)
11. SHAS (Au, Ag)
12. GOLDEN LION (Ag, Pb, Zn, Cu, Au)
13. BILL (Au, Ag)
14. RON (Cu, Ag, Au)
15. GERLE GOLD (Au)
16. RED (Cu, Au, Mo)
17. ADITKA (Au)
18. HAIRL (Au, Ag)
19. RBG (Au, Cu, Ag, Pb, Zn)
20. INEL (Ag, Zn, Cu)
21. BIG MISSOURI (Au, Ag)
22. SILBAK PREMIER (Au, Ag)
23. SUMMIT (Au, Ag)
24. PROSPERITY–PORTER IDAHO (Ag, Pb, Zn)
25. APRIL (Au, Ag)
26. Y5 to Y7 (Au, Ag)
27. YELLOW GIANT (Au)
28. HUNTER (Au)
29. SCOTIA (Zn)
30. INK (Ag, Cu)
31. OX–C, OX–EAST (Ag, Cu, Au)
32. COPPERHILL (Zn, Cu, Ag)
33. NEW MOON (Cu, Ag)
34. BOB CREEK (Ag, Au, Zn, Pb)
35. EQUITY SILVER MINE (Ag, Cu, lb, Au)
36. SILVER RED (Cu, Ag)
37. CAPOOSE (Ag, Cu, Au, Pb, Zn)
38. TELKWA (Coal)
39. ZYMOETZ (Coal)
40. BIJETUT (Coal)
41. KLAPPAN (Coal)
42. DAN–DRAIN (Placer Gold)
43. WHEATON CREEK (Placer Gold)
44. SCOTTIE GOLD MINE (Au)
45. DUTHIE MINE (Au, Ag, Pb, Zn, Cu, Cd)
46. TAURUS MINE (Au, Ag)
47. PINE PASS–WILLOW CREEK (Coal)
48. NORTH SECUS (Coal)
49. ORION LAKE (Coal)
50. WINDFALL (Coal)
51. WOLVERINE (Coal)
52. MONKMAN (Coal)
53. McCONNEY (Coal)
54. BABCOCK (Coal)
55. ALEY (Pb, Zn, Ag)
56. HEIDI (Au, Cu)
57. QR (Au)
58. FRASERGOLD (Au)
59. CARIBOO HUDSON (Au)
60. ROUNDTOP MOUNTAIN (Au)
61. YANKS PEAK (Au)
62. MEGABUCK (Au, Cu)
63. SPANISH LAKE (Au)
64. NOOK (Cu, Au)
65. NIFTI (Pb, Zn, Ag)

In the HOUSTON-SMITHERS area, ASARCO EXPLORATION CO. OF CANADA LTD. completed 36 backhoe pits on the IRK property (30) in search for the source of rhyolite braccia float which carries a fine grained black mineral high in silver values. Two areas of east-west trenches near the centre of the claims disclosed silicified-pyritized rhyolite breccia similar to the mineralized float in appearance, but carrying no silver values. On the OX-EAST and OX-C precious metals properties (31), located in the TROITSA-WHITESAIL AREA, INTERNATIONAL DAMASCUS completed 990 metres of drilling in 16 holes. Earlier, COMINCO LTD. under an option agreement, completed a large backhoe trenching program in search of a large, bulk tonnage polymetallic deposit in acidic ash flow tuffs. COMINCO identified three vein structures, the largest being 500 metres in length containing tetrahedrite, sphalerite, galena, with some boulangerite and tourmaline. On the adjoining LEAN-TO prospect to the west, LANSDOWNE OIL & MINERALS conducted a minor trenching program in an area where 38 shallow diamond drill holes totalling 1 917.3 metres, drilled in 1983, intersected a large mineralized breccia zone within strongly silicified-pyritized quartz-feldspar porphyry and tuffaceous rocks of intermediate composition. On the COPPERHILL (GROUSE MOUNTAIN) base metal prospect (32), TECK CORPORATION, under a joint venture with RAMM VENTURE CORP., completed 1 896 metres of drilling in 19 holes. The holes tested along strike and at depth six mineralized zones, outlined by earlier geochemical and geophysical surveys and backhoe trenching. Silver-zinc-copper mineralization is associated with northeast trending structures. On the NEW MOON volcanogenic massive sulphide prospect (33), located 100 kilometres SSW of Smithers, ST. JOE CANADA INC. completed 963 metres of drilling in four holes in an effort to locate the source of ferruginous chert boulders mineralized with high grade copper and emanating from the New Moon Glacier.
SELCO INC. completed 1 247 metres of drilling in eight holes on the BOB CREEK polymetallic prospect (34), located ten kilometres south of Houston. Pyrite-marcasite-sphalerite veinlets carry low gold-silver concentrations related to fracture zones within a large pyrite-sericite-clay-carbonate alteration zone hosted by Jurassic (Hazelton Group) dacitic tuffs and Upper Cretaceous (Kasalka Group?) felsic units intruded by quartz-feldspar porphyry dykes. At the EQUITY SILVER MINE (35), EQUITY SILVER MINES LTD. completed 2 929 metres of diamond drilling in 22 holes on the Waterline Zone, 544 metres in four holes on the Superstition Zone, and 14 holes totalling 2 100 metres in the hangingwall to test the depth potential below the floor of the Southern Tail Zone pit. In addition, 1 500 lineal metres of trenching was carried out east of the Southern Tail Zone pit. Based on a 90 grams per tonne silver equivalent cut-off, open-pit reserves (as of September 1, 1984) were estimated at: Main Zone - 17 281 000 tonnes grading 110 grams of silver per tonne, 0.37 percent copper and .99 grams of gold per tonne; Waterline Zone - 2 526 000 tonnes grading 93 grams of silver per tonne, 0.38 percent copper and 1.39 grams of gold per tonne.

On the SILVER RED (FENTON CREEK) massive sulphide prospect (36), located 80 kilometres south of Smithers, COMINCO LTD. conducted a large percussion drill program in search of the source of massive sulphide float and geochemical and geophysical anomalous zones. GRANGES EXPLORATION completed 654.8 metres of drilling in six holes on the CAPOOSE prospect (37), located 105 kilometres southeast of Burns Lake. Three zones of precious ("bulk silver") and base metal mineralization occur within rhyolitic and andesitic volcanics which have been metamorphosed and contain varying amounts of garnet. Previous geological reserves were estimated at 20 million tonnes grading 0.5 grams of gold per tonne and 48 grams of silver per tonne, plus lead and zinc. The 1984 drilling was concentrated on Zones 1 and 2, as fill-in holes (mainly to the south) and to test the gold content more thoroughly.

Coal

Aggressive exploration programs were carried out on three areas in northcentral-northwestern British Columbia. On the TELKWA property (38), CROWSNEST RESOURCES LTD. completed 5 000 metres of diamond drilling in 44 holes. Exploration drilling tightened geological control on the East Goathorn proposed pit, delineated additional reserves north of this pit, and explored the potential of coal-bearing Skeena sediments north of the Telkwa River. A Stage Two report is scheduled to be completed by early 1985. To date, 18 rotary and 119 diamond drill holes, together with bulk samples and a test pit have helped define reserves of approximately 50 million tonnes of excellent, medium to high volatile bituminous coal in ten seams with an aggregate thickness of 14 to 18 metres in an 85 to 100 metre stratigraphic section. On the ZYMOETZ property (39), located west of the Telkwa property, CROWSNEST RESOURCES LTD. completed 300 metres of diamond drilling in two holes. CROWSNEST expects to be active on both properties again next year.

SUNCOR INC. completed 1 027.8 metres of diamond drilling in ten holes on the SUSTUT coal measures (40), located 170 kilometres NNE of Smithers. Substantial middle to late Jurassic coal seams with low to high volatile bituminous ranks have been identified but intense faulting and folding, as well as the presence of thick overburden in valley bottoms, has made exploration difficult.

GULF CANADA RESOURCES INC. continued to actively explore and develop its MOUNT KLAPPAN (41) anthracite property during 1984. Road access to the property was established. Eight diamond and 17 rotary drill holes were completed with cumulative totals of 1 056 metres and 897 metres respectively. In addition, 128 trenches were excavated by mechanical means and 95 were dug by hand, in various coal exposures. Late in the year, 67 tonnes of anthracite was extracted for testing in the water filtration market and a 20 000 tonne trial shipment was sold for test-marketing in Europe. Inferred reserves of 960 million tonnes have been estimated within four areas which comprise less than 10 percent of the property. To date,

two potential open pit mines, the Lost-Fox and Hobbit-Broatch pits, have been identified, both capable of producing up to five million tonnes per year of high quality anthracite coal. The Lost-Fox area contains an inferred resource of 330 million tonnes and the Hobbit-Broatch area contains an inferred resource of 620 million tonnes; both areas could sustain open pit mining over a 20 year period.

Placer

In the ATLIN AREA, the largest placer gold operation was the DAN-DRAIN GROUP (42) on Little Otter Creek. An average of 2 300 cubic metres of material per day was processed during the summer months by up to 20 employees with some measure of success. In the KUTCHO CREEK AREA, an average of 300 cubic metres of material per day was processed during the summer months on the WHEATON CREEK property (43).

Notices of Work

The number of Notices of Work on Mineral Claim, Form 9-10, filed to November 1984 is up approximately 72 percent and 52 percent from 1983 and 1982 respectively. Placer notices are down approximately 20 percent from 1983 and 11 percent from 1982. Drill programs are up 43 percent from 1983 and up 70 percent from 1982. Total drilling for metals exceeded 68 000 metres, for coal the total was 7 980 metres, and for industrial minerals 625 metres.

TABLE 2
LEVEL OF ACTIVITY
DERIVED FROM NOTICES OF WORK ON MINERAL CLAIM, FORM 9-10

Mining	1982				1983				1984			
Division	Min.	Coal	Drill	Placer	Min.	Coal	Drill	Placer	Min.	Coal	Drill	Placer
Atlin	34	-	3	103	16	-	4	80	44	-	7	65
Liard (W)	21	-	7	17	16	-	8	56	30	-	10	39
Omineca	54	3	14	2*	66	4	18	-*	107	4	32	1*
Skeena	32	-	13	1	26	-	12	1*	33	-	14	4
Total	141	3	37	137	124	4	44	137	214	4	63	109

*Does not include Omineca gold field (Germansen Landing - Manson Creek).

DEVELOPMENTS

None of the major prospects are in the development phase, although the LAWYER'S (8), MIDWAY (3), and KLAPPAN (41) properties are very close to being so. Development is proceeding at the ERICKSON GOLD MINE (4), the SCOTTIE GOLD MINE (44), and the DUTHIE MINE (45) where a new 60 tonnes per day mill has just been completed.

PRODUCERS

(1) ERICKSON GOLD MINE (4) operated at 254 tonnes per day with an average grade of 16.5 grams of gold per tonne. Since start of production in 1978, more than 4 160 000 grams of gold have been produced from 273 000 tonnes of ore.

(2) TAURUS MINE (46) (Au-Ag) operated at 136 tonnes per day.

(3) CASSIAR ASBESTOS MINE operated at about 100 000 tonnes per day (asbestos).

(4) SCOTTIE GOLD MINE (Au-Ag) operated at approximately 180 tonnes per day. A limited amount of surface diamond drilling and underground development have increased reserves which are estimated at 113 375 tonnes grading 17.15 grams of gold per tonne. The mine faces a major decision regarding keeping the mine operating and utilizing the Granduc access road over the winter months - a very costly proposition.

(5) DUTHIE MINE (Au-Ag-Pb-Zn-Cu-Cd) constructed a new 60 tonne per day mill and processed approximately 100 tonnes of concentrate averaging 5 340 grams of silver per tonne.

(6) EQUITY SILVER MINE (35) operated at approximately 5 700 tonnes per day. Mining from the Southern Tail Zone pit was completed in the Spring of 1984 and mining from the Main Zone began immediately thereafter. The leach plant was closed down in the spring, and in the Fall a precious metals scavenger plant was constructed using conventional cyanidation and carbon-in-pulp technology to improve recoveries of both gold and silver.

(7) GRANDUC MINE closed officially in June 1984.

(8) BELL COPPER MINE remains closed indefinitely.

(9) ENDAKO MOLYBDENUM MINE remained closed indefinitely.

(10) KITSAULT MOLYBDENUM MINE remained closed indefinitely.

SUMMARY OF EXPLORATION - NORTHEAST DISTRICT

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INTRODUCTION

Coal exploration activity in the northeast district was very subdued in 1984 due to a continuing depressed world market. Many properties remained idle, some were dropped (eg. EAST MT. GETHING-UTAH MINES), and there were further staff cuts (eg. CROWSNEST RESOURCES).

Thirteen notices of work were submitted this year in comparison to 7 last year, but the number of companies doing work dropped from 6 to 4. Only two companies (Quintette and Crowsnest) did any drilling. Quintette Coal accounted for 8 of the 13 notices of work and 87 of the 93 diamond and rotary holes drilled.

COAL EXPLORATION

A summary of exploration statistics is presented in Table 3 with a comparison to 1983 activity.

West of Chetwynd and just north of Highway 97 CROWSNEST RESOURCES drilled 5 diamond holes on their PINE PASS property (47). Coal seam thicknesses encountered in the Gething Formation were respectable (to 4 metres) but did not match those seen in surface trenches. Just south of the highway some mapping was done on WILLOW CREEK licenses. CROWSNEST also drilled one diamond hole in the Gates Formation on NORTH SECUS property (48) and abandoned another at ONION LAKE (49) in overburden. Total exploration costs exceeded $300,000.00.

GULF CANADA RESOURCES confined their activities to a few weeks of mapping and trenching on the WINDFALL (50) and WOLVERINE (51) properties where the Bickford formation (=Brenot Formation of Gulf) is of economic interest. No seams greater than 1.5 metres were found.

PETRO CANADA did a resistivity survey and some mapping to check a structural reinterpretation on the MONKMAN property (52). No notice of work was filed since no surface disturbance occurred. New data supports the reinterpretation, and drilling is planned for next summer.

QUINTETTE spent $850,000 on a series of properties extending from the McCONKEY MINE site (53) to BABCOCK MTN. (54) inclusive (Figure 3). The aim of the program was to define all reserve areas in the vicinity of the plant site and between the major pit at McConkey and a future pit at Babcock.

In the MARMOT EXTENSION area of McConkey pit 17 holes were drilled into a repetition of the coal-bearing interval in the Gates Formation below the Mesa fault. Much faulting and folding was encountered and the recovery of these reserves will be difficult. At FRAME NORTH drilling was aimed at additional structural control in the north limb of the Frame syncline.

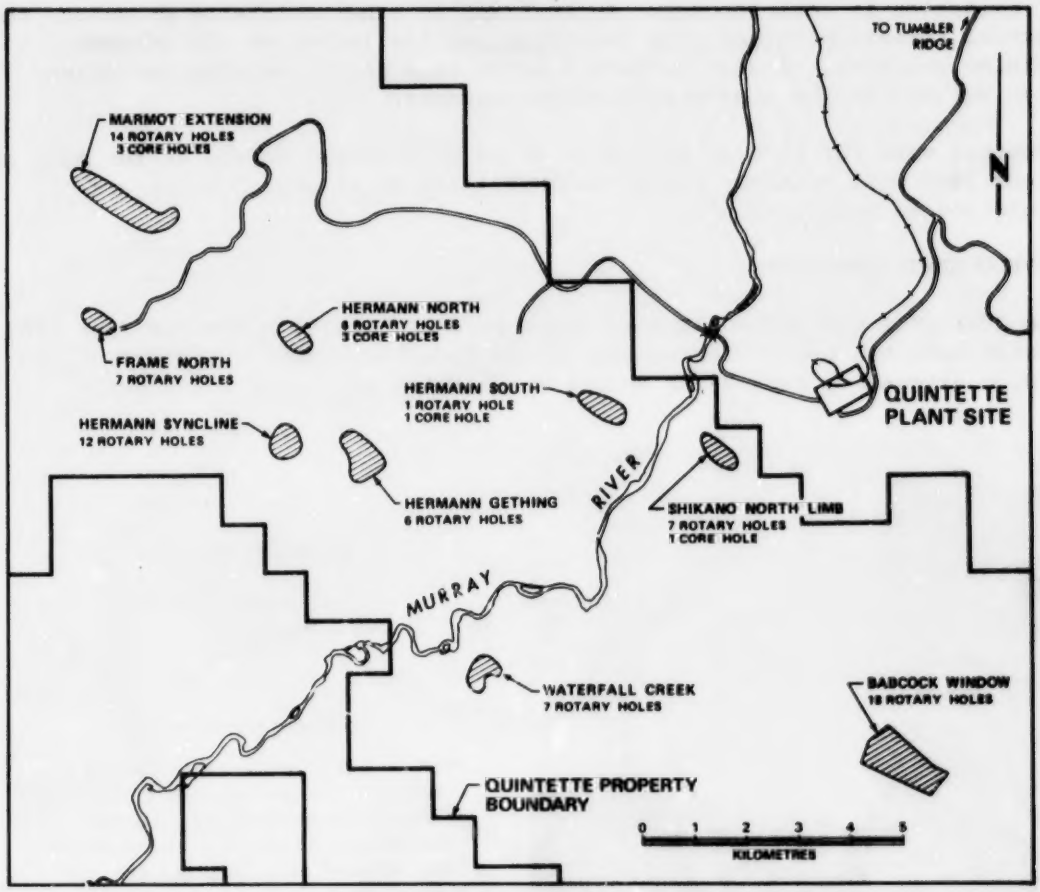

FIGURE 4

QUINTETTE COAL LTD.,
AREAS OF 1984 EXPLORATION

At HERMANN SYNCLINE easily mineable near surface coal is present (less than 1 million tonnes) but it is all oxidized. At HERMANN NORTH less than 2 million tonnes are present in a near dip slope situation. HERMANN SOUTH and SHIKANO NORTH LIMB drilling tested the same synclinal structure of economic interest. Drilling at WATERFALL CREEK gave discouraging results due to numerous rock partings in the seams. The purpose of the program in the BABCOCK WINDOW area was to determine the extent of overburden and the limits of oxidation in coal subcrop. In contrast to other Quintette programs, the Gething Formation rather than the Gates was the target on the HERMANN GETHING property. A near surface 6 metre seam of the Gething was traced with washout of the seam suspected in one area.

Proposed work for 1985 at Quintette is to be directed solely at the main pit areas (BABCOCK, SHIKANO, FRAME, McCONKEY) and total expenditures are projected to nearly double.

DEVELOPMENTS/PRODUCERS

The QUINTETTE and BULLMOOSE coal mines were officially opened in June 1984 though both had been shipping coal since December, 1983. QUINTETTE COAL LTD. continued to expand the McCONKEY and FRAME pit areas and greatly

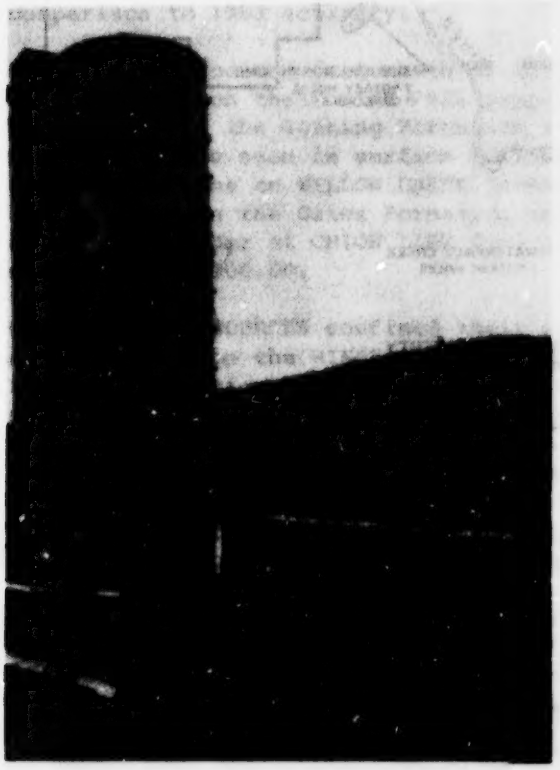

PHOTO 4 - British Columbia Railway electric train and loadout facilities at Teck's Bullmoose Mine. Current reserves are 33 million tonnes of clean product metallurgical and thermal coal.

TABLE 3
COMPARATIVE SUMMARY OF COAL EXPLORATION STATISTICS
1983 AND 1984 - NORTHEAST DISTRICT

	Mapping and Trenching		Drilling	
	1984	1983	1984	1983
QUINTETTE COAL LTD.				
Marmot Extension	XX		14 rdh 3 ddh	
Frame North			7 rdh	
Hermann North	XX	XX	6 rdh 3 ddh	5 rdh
Hermann Syncline	XX		12 rdh	
Hermann Gething			6 rdh	
Hermann South	XX		3-4 rdh 1 ddh	
Shikano North Limb			7 rdh 1 ddh	
Waterfall Creek			7 rdh	
Babcock Window			18 rdh	
CROWSNEST RESOURCES				
Willow Creek	XX (no notice of work)			
Pine Pass (Noman Creek)	XX	XX	5 ddh	1 ddh
North Secus			1 ddh	1 ddh
Onion Lake			1 ddh	(abandoned)
GULF CANADA RESOURCES				
Windfall	XX			
Wolverine	XX			
Goodrich		XX		3 ddh
PETRO CANADA				
Monkman	XX (no notice of work)	XX		
ESSO				
Falling Creek		XX		7 ddh
CINNABAR PEAK MINES				
Mt. Johnson				3 ddh

increased the amount of development drilling to get better control of coal seam thickness and position. Production at Quintette will reach 5 million tonnes metallurgical coal, 1.3 million tonnes thermal coal. About 3.2 million tonnes of metallurgical coal and 0.8 million tonnes of thermal coal projected to year end were mined in 1984. It appears there will be an accelerated date for pit development at Shikano and Babcock.

During 1984 the BULLMOOSE MINE of Teck Corp. increased its contract with the Japanese from 1.7 to 2.05 million tonnes metallurgical coal per year but with a drop in price of about $10.00 per tonne. About 1.8 million tonnes were mined in 1984. Sixty thousand tonnes thermal coal were sold on the spot market and another 300 to 400 thousand tonnes raw thermal coal are stockpiled.

CENTRAL DISTRICT

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INTRODUCTION

There was an increase of approximately 15 percent in mineral exploration programs and 22 percent in placer operations in the Central District in 1984 compared to the previous year. Most of the increase in mineral exploration took place in the Cariboo, especially in the Quesnel "gold belt", with activity in other parts of the district being at or below 1983 levels.

Precious metals in all types of deposits dominated the exploration targets throughout the district, although there was some interest in industrial minerals and stone. The majority of exploration programs continued to be low-budget.

EXPLORATION

Minerals

Exploration in the OMINECA declined about 25 percent, despite the Regional Geochemical Release for NTS 93N (Manson River) which generated only modest activity. Interest in the search for sediment-hosted base metal-silver deposits in the Gataga-Muskwa Ranges continued to decline. COMINCO however, completed 14 kilometres of access trails and a trenching program on their ALEY property (55), with encouraging results. The HEIDI property (56), a promising discovery of disseminated gold-copper mineralization in altered Takla Group volcanics near the Mt. Milligan stock, was optioned to BP EXPLORATION CANADA LTD. who later staked additional ground in the area.

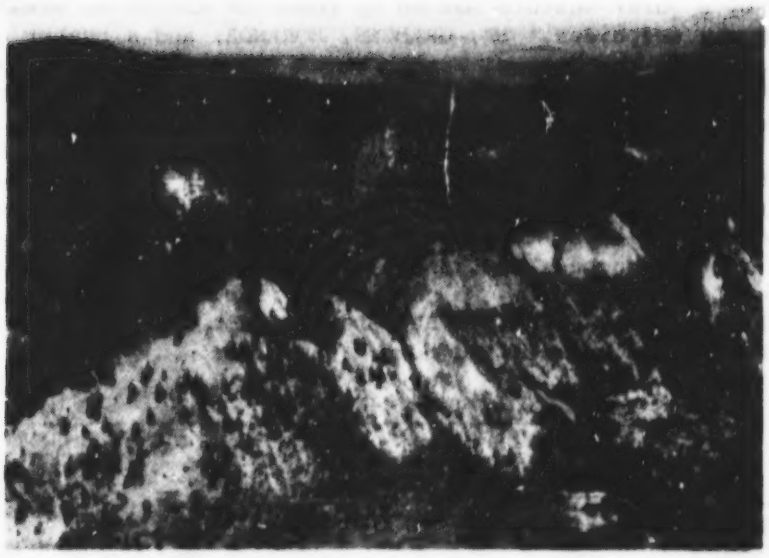

PHOTO 5 - QR Deposit, view north showing West Zone and Main Zone. Drill indicated reserves 862 100 tonnes grading 6.8 grams of gold per tonne.

There was a 23 percent increase in exploration programs in the CARIBOO, mostly in the Quesnel Trough and Hadrynian metasediments to the east. An area of approximately 20 X 110 kilometres from near Quesnel SW to Wells Gray Park is now almost completely staked. DOME completed 24 holes totalling 2 000 metres on the WEST ZONE of their QR (57) porphyry-related gold deposit to determine the structure and add to the published reserves which at this time stand at 862 000 tonnes of open pittable material grading 6.8 grams of gold per tonne. AMOCO completed 9 holes on the FRASERGOLD property (58) optioned from EUREKA RESOURCES to define and extend zones of irregular dissemination of visible gold in phyllites found by drilling in 1983. Some success was reported by companies working on former gold producers and gold properties. IMPERIAL METALS completed over 1 000 metres of drilling on the CARIBOO HUDSON property (59) and have substantially increased the published reserves of 27 215 tonnes of gold bearing quartz grading 14.4 grams of gold per tonne in the Shasta vein. SUNCOR completed mapping, geochemistry and geophysics programs on their ROUNDTOP MTN. (60) and YANKS PEAK (61) properties, and have outlined promising targets on both. Mineralization found to date is confined to quartz veins along the Rainbow-Baker contact. Elsewhere in the Cariboo, PLACER dropped their option on the MEGABUCK property (62), a volcanic-hosted copper-gold prospect, after indifferent drilling results. Among the large number of programs by junior companies, MT. CALVERY RESOURCES has discovered a sizeable area of phyllites and low-grade metasediments containing significant gold mineralization on their SPANISH LAKE option (63). Another target on the NOOK property (64), a presumed Cyprus or Besshi-type deposit,

was drilled by a joint venture headed by COMAPLEX RESOURCES without intersecting any sulphides. BP, GRANGES, NORANDA, and a number of juniors have been active in the Quesnel Trough south of Prince George, with programs from "grass roots' to limited test drilling. The area will be the subject of a Regional Geochemical Survey release in mid-1985.

In the western part of the District, IMPERIAL METALS continued work on their NIFTI property (65), a volcanogenic massive sulphide prospect, and completed some shallow test holes at the end of the season with encouraging results. Some "grass roots" programs and re-evaluation of older properties continued in the Chilko Lake area by several companies, including WESTMIN at the old TAYLOR WINDFALL MINE and GENOVEVA RESOURCES on the nearby SPOKANE property (66), both precious metal-bearing porphyry systems.

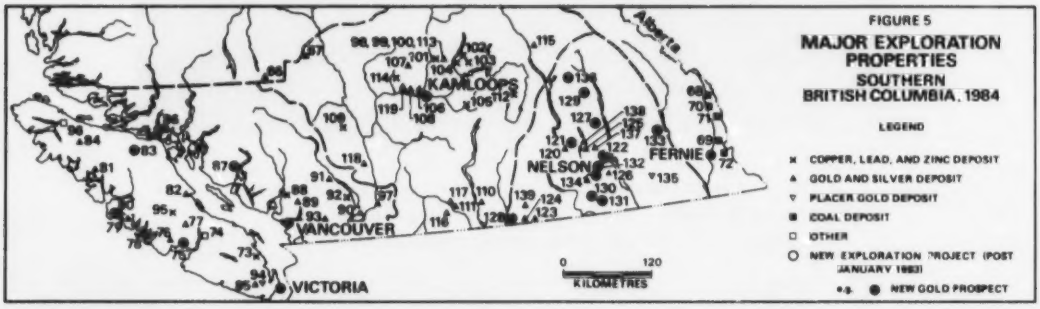

FIGURE 5

MAJOR EXPLORATION PROPERTIES

SOUTHERN BRITISH COLUMBIA, 1984

LEGEND

- COPPER, LEAD, AND ZINC DEPOSIT
- GOLD AND SILVER DEPOSIT
- PLACER GOLD DEPOSIT
- COAL DEPOSIT
- OTHER
- NEW EXPLORATION PROJECT (POST JANUARY 1983)
- e.g. NEW GOLD PROSPECT

86. TAYLOR WINDFALL, SPOKANE (Cu, Au)
87. BLACKDOME MOUNTAIN (Au, Ag)
88. FORDING (Coal)
89. BALMER (Coal)
70. GREENHILLS (Coal)
71. LIME CREEK (Coal)
72. COAL MOUNTAIN (Coal)
73. MT. SICKER (Cu, Zn, Zu, Ag)
74. THISTLE (Cu, Au, Ag)
75. WICK (Au)
76. UNITED TOMMY (Au, Ag, Cu)
77. TAY (Au)
78. KALAPPA (Au, Ag, Cu)
79. AU, FLORES ISLAND (Cu, Ag)
80. HESQUIAT LAKE (Au, Ag, Zn, Pb)
81. ZEBALLOS (Au)
82. MT. WASHINGTON (Au, Ag, Cu)
83. BRUNO (Au, Ag, Cu)
84. WIMPKIEN (Au, Ag, Zn)
85. VALENTINE MTN. (Au, Ag)
86. DORATHA MORTON (Au)
87. SKWIM LAKE (Au, Ag, Zn, Cu)
88. BRITANNIA (Cu, Zn, Au, Ag)
89. MAGGIE MINES (Au, Ag, Cu, Zn)
90. RN MINE (Au)
91. DOCTORS POINT (Au, Ag)
92. BIGFOOT (Cu, Zn, Au, Ag)
93. SKY (Au)
94. LEECHTOWN PLACERS (Au)
95. MYRA FALLS (Au, Ag, Cu, Pb, Zn)
96. ISLAND COPPER (Cu, Mo, Au)
97. CAROLIN MINE (Au)
98. REA GOLD (Au, Ag, Cu, Pb, Zn)
99. APEX-TWIN (Au)
100. BAR (Au, Ag, Cu, Pb, Zn)
101. MT. ARMOUR (Cu, Pb, Zn)
102. WAD (Cu, Pb, Zn)
103. LUCKY COON (Pb, Zn, Ag)
104. BECA (Pb, Zn)
105. TOP (Cu, Ag)
106. ALLIES COPPER (Au)
107. PRECISELY (Au)
108. KARA (Au)
109. SILVER QUEEN (Pb, Zn, Ag)
110. DUSTY MAC (Au)
111. GOOD HOPE, CANTY (Au)
112. SHERPA-REBAR (Zn, Pb)
113. MIX2 (Cu, Pb, Zn)
114. MOW (Cu, Ag, Au)
115. J & L (Au)
116. BANBURY MINES (Au)
117. MASCOT GOLD (Au)
118. BRALORNE MINE (Au)
119. REN-KAM (Au)
120. TILLICUM MOUNTAIN (Ag, Au)
121. CARIBOU (Au)
122. WHEELER LAKE (Ag)
123. WINNIPEG (Au)
124. SYLVESTER K (Au)
125. AYLMIN CREEK (Cu, Au, Ag, Mo)
126. WISCONSIN (Au)
127. RED DIAMOND (Au, Ag)
128. SKYLARK (Ag)
129. RED ELEPHANT (Au)
130. ROOT (Au)
131. YMIR GOODENOUGH (Au, Ag)
132. LASKA (Au, Ag)
133. ALPINE (Zn, Cu)
134. REFERENDUM (Au, Ag)
135. MOYIE RIVER PLACER (Au)
136. GAINER CREEK PLACER (Au)
137. DICKENSON MINE (Ag, Pb, Zn)
138. LITTLE TIM (Ag)
139. DENTONIA (Au, Ag)

Notices of Work

As of the end of October 1984, a total of 124 Notices of Work on a Mineral Claim, Form 9-10, and 651 Notices of Work for Placer, Form 6-7 were received. The Mineral notices, by Mining Division, are given below, with 1983 figures for comparison.

TABLE 4
LEVEL OF ACTIVITY
DERIVED FROM NOTICES OF WORK ON MINERAL CLAIM, FORM 9-10

	Liard	Omineca	Cariboo	Clinton	Total
1983	0	20	81	7	108
1984	1	15	100	8	124

DEVELOPMENTS

BLACKDOME EXPLORATION LTD. continued to develop their epithermal gold-silver property at BLACKDOME MTN. (67), concentrating on drifting and raising on the southern part of the No. 1 vein and some limited work on the No. 2 vein. Both have returned some very high grade assays. Some 700 metres of drifting and 160 metres of raising have been completed in the south mine area since June. Current reserves indicated by underground work and by drilling stand at 176 900 tonnes grading 26.7 grams of gold per tonne and 109.7 grams of silver per tonne.

PRODUCERS

The outlook continues gloomy for metal producers in the district, with ENDAKO continuing on indefinite shutdown, GIBRALTAR managing to break even with a reduced work force by mining higher grade pit ore, and MOSQUITO CREEK GOLD MINE remaining closed, while efforts by HUDSON BAY MINING and SMELTING to develop new ore reserves under its option agreement have to date been unsuccessful.

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INTRODUCTION

Exploration in the district maintained the level of the previous year. Nine Notices of Work on a Mineral Claim Form 9-10 were filed, an increase of two over 1983. Dia Met Minerals Ltd. continued small-scale sampling of kimberlitic material on the Jack and Mark claim groups, north of Golden. Other exploration programs in the district were small by provincial standards, and consequently the following discussion is concerned with coal exploration and development only.

COAL EXPLORATION

Exploration was carried out by the producing companies only, and was generally concentrated near the existing mine-sites.

FORDING COAL (68) drilled 7 diamond drill holes totalling 2 494 metres and 21 rotary drill holes totalling 4 794 metres on EAGLE MOUNTAIN, site of the largest current new development in the southeast (see Table 5). Fording also drilled a total of 20 rotary drill holes totalling 4 608 metres in adjacent areas, including MT. TURNBULL, HENRETTA CREEK, CASTLE MOUNTAIN, and GREENHILLS RANGE.

WESTAR MINING was active on several fronts adjacent to the BALMER OPERATIONS AREA (69). The major undertaking was extraction of 12 000 tonnes of A-seam coal from a test pit on NATAL RIDGE. Work on Natal Ridge also included adits in each of C- and D-seams, and 40 rotary drill holes totalling 3 434 metres, mostly also aimed at the upper seams. Within Balmer Operations, Westar also drilled 36 rotary drill holes totalling 2 451 metres at HARMER KNOB EAST, and 8 rotary holes totalling 3289 metres at HARMER KNOB WEST.

WESTAR was also active in the GREENHILLS OPERATION AREA (70). At the GREENHILLS MINE itself 19 rotary holes (1 301 metres) were drilled up to the time of writing, and more work was planned for later in the year. On the BURNT RIDGE EXTENSION property, less than 3 kilometres to the east, a rotary drilling program was underway at the time of writing. Five holes totalling 1 125 metres out of seven that are planned have been completed to date.

CROWSNEST RESOURCES began a major test of the feasibility of underground mining north of the highwall of LINE CREEK MINE (71). One adit in 8-seam was expected to reach its final length of 250 metres by the end of 1984. Five cross-cuts were planned, which, with partial pillar extraction, would allow for extraction of 10 000 to 11 000 tonnes of raw coal. On LINE CREEK EXTENSION, immediately to the north of the mine, 33 rotary holes were

TABLE 5
SOUTHEAST DISTRICT - SUMMARY OF COAL EXPLORATION FOR 1984

COMPANY	PROPERTY	ACTIVITY	COMMENTS
Fording	Eagle Mountain	Diamond drilling Rotary drilling	7 holes; 2 494 metres 21 holes; 4 794 metres
Fording	Mt. Turnbull	Rotary drilling Geological mapping and sampling	1 hole; 186 metres
Fording	Henretta Creek	Rotary drilling	5 holes; 1 275 metres
Fording	Castle Mountain	Rotary drilling Geological mapping and sampling	5 holes; 1 334 metres
Fording	Greenhills Range	Rotary drilling Wire-line core drilling	9 holes; 1 813 metres 6 holes; 123 metres
Westar	Greenhills Range	Rotary drilling Seam tracing	6 holes; 515 metres (Porter Creek) 13 holes; 786 metres (Eagle Pit); more 16-seam; 1.5 kilometres west side on north end
Westar	Natal Ridge upper seams (A, C & D)	Rotary drilling Adits Test pit Geol. mapping	31 holes; 2 460 metres 2; C & D seams 1; A-seam; 11 937 tonnes
Westar	Natal Ridge (6 & 7 seams)	Rotary drilling Adits Geol. mapping	9 holes; 974 metres 3
Westar	Harmer Knob East	Rotary drilling Adit Geol. mapping	36 holes; 2 451 metres 1
Westar	Harmer Knob West	Rotary drilling Geol. mapping	8 holes; 328 metres
Westar	Burnt Ridge Extension	Rotary drilling	5 holes; approx. 1 125 metres; 2 more to complete.
Byron Creek	Coal Mountain	Rotary drilling	111 holes; 13 668 m
Crowsnest Res.	Line Creek Mine	Adit	1 in 8-seam, developed from mine highwall; 56 metres in length by Ocober 31; total length 250 metres with 5 cross-cuts; 10 000 to 11 000 tonnes including 50% recovery of pillars; should be complete by Christmas
Crowsnest Res.	Line Creek Extension	Rotary drilling Geological mapping	33 holes; 3 087 metres to define first three years of mining 1:1 000 scale
Crowsnest Res.	Marten Creek	Geological mapping and sampling	

drilled totalling 3 087 metres, and a large scale geological map was produced. These efforts were designed to outline reserves for the first three years of surface production from the Extension property.

BYRON CREEK COLLIERIES' 1984 exploration program involved drilling of 111 rotary holes totalling 13 668 metres in the COAL MOUNTAIN MINE (72). The work, which was concentrated at the north end of this thermal coal mine, was carried out mainly for pit design purposes, and thus represents a very advanced stage of exploration. The large size of the program was necessitated by the extreme structural complexity of Coal Mountain.

DEVELOPMENTS/PRODUCERS

FORDING COAL's EAGLE MOUNTAIN project (68) was officially opened in April. Another important milestone achieved this year was the commencement of mining of 15-seam, the uppermost economic seam in the section, from near the top of the mountain. The mine plan for Eagle Mountain involves mining the entire mountain, which necessitates moving a considerable amount of barren rock overlying 15-seam. This high-strip-ratio component of the project is balanced by extraction from older pits located in both the Eagle Mountain and Greenhills areas, and from new pits on the east flank of Eagle Mountain.

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INTRODUCTION

Exploration activity in the southwest district during 1984, as measured by the number of projects reported, was down approximately 25 percent from 1983. However, a higher proportion of the projects involved drilling than was the case last year. Placer activity on Vancouver Island is down by about 45 percent and coal exploration in the southwest is at a standstill.

Almost all mineral exploration in the district has again been focussed on the search for economically viable precious metal deposits. Those porphyry and polymetallic base metal occurrences which are being examined are only of interest if they contain significant gold or silver. With the exception of the Kennedy River area and the Sicker volcanic belt on Vancouver Island all of the areas which were very active in 1983 have seen the level of activity cut back to a smaller number of projects. Although many operators have described their results as encouraging, no major new discoveries have so far been reported in 1984. The highlight in the southwest district is probably the report by Abo Oil Corporation of exciting drill intersections in a new zone of their gold property on Harrison Lake.

EXPLORATION

Minerals

On VANCOUVER ISLAND, activity remained high in the belt of Paleozoic Sicker group rocks stretching from Saltspring Island northwestward to Port Alberni. The main participants are major mining companies and their targets are polymetallic massive sulphide occurrences similar to Western Mines. KIDD CREEK MINES staked a large part of southwestern Saltspring Island, flew an airborne geophysical survey over the claims and carried out ground follow-up in selected areas. FALCONBRIDGE LTD. completed an airborne survey of the Mt. Richards area north of Duncan, followed by geophysical and geological work on the ground, and culminating in the drilling of 8 holes. CORPORATION FALCONBRIDGE COPPER completed a small drilling program early in the year and then carried out extensive geological and geophysical surveys on their optioned property centred on the old mine workings (Twin J) at MT. SICKER (73). At Mt. Brenton, ABERFORD RESOURCES continued systematic exploration of the large Lara property, optioned from Laramide Resources, with geophysics, trenching, and some late-season drilling. UTAH MINES optioned the JRM property north of Chemainus from prospector Jim Joyce, greatly extended it by staking, and then completed systematic geological,

geophysical, and geochemical surveys. CHEVRON CANADA RESOURCES conducted an airborne survey with ground follow-up and late-season drilling totalling 300 metres in two holes on the Cowichan Cu-Co-Au property optioned from Canamin Resources (Efrem Specogna) at Heather Lake west of Ladysmith. EFREM SPECOGNA did some rock trenching on his Sognidoro property at Rheinhart Creek and reports gold in a wide pyritic schist horizon traceable for 245 metres. At the THISTLE MINE south of Port Alberni (74), WESTMIN RESOURCES carried out airborne and ground geophysics, soil geochemistry, and geological mapping followed by 1 167 metres of drilling in 9 holes. The Thistle property, optioned from Nexus Resource Corporation, is a former producer of gold and copper from stratabound massive sulphides in Sicker volcanics. Also in Sicker volcanics and located southwest of Port Alberni, NORANDA EXPLORATION, in a joint venture with UMEX, drilled 5 holes in the Lizard gold prospect with encouraging results. AU RESOURCES completed a geochemical survey and have proposed trenching of a gold prospect on the Emma claims at McLaughlin Ridge. In the same general area, FALCONBRIDGE LTD. drilled 4 holes at the Villalta property optioned from Canamin. EUREKA RESOURCES completed a small drilling program in a fault zone mineralized with gold and silver on the Songbird property near Parksville.

Another area on Vancouver Island which saw a lot of activity in 1984 was the KENNEDY RIVER gold belt from Sproat Lake to Ucluelet. Prior to the field season, it was widely reported that in excess of 4,000 claims had been staked and many property acquisitions were publicized. Many old and new showings were examined, mostly by prospectors and small companies, but no large-budget programs materialized. Nevertheless, several of the participants have been pursuing gold mineralization models of the "epithermal" and "porphyrite" type associated with Tertiary intrusive activity. This is a departure from the traditional association of gold with Island Intrusions and Karmutsen volcanics and gives promise of success throughout the Kennedy River belt and all along the west coast of Vancouver Island. At the WICK property north of Toquart Bay (75), VICTORIA RESOURCE CORPORATION carried out mapping, prospecting and sampling of old workings. They describe gold-bearing quartz veins associated with Tertiary feldspar porphyry intrusions and report erratic but impressive gold assays as high as 132 grams per tonne. TECK CORPORATION at the UNITED TOMMY property (76), optioned from International Phoenix Energy and prospector Waldo Ejtel, have completed geophysical surveys , soil and rock sampling and have indicated plans to drill late in the year. The focus of interest is a system of parallel, vuggy, gold-base metal-quartz veins reported to be traceable for 2 kilometres and giving chip sample values up to 4.2 grams of gold per tonne across 5 metres. At the AU claims, south of United Tommy, TECK CORPORATION on behalf of MULTINATIONAL RESOURCES, completed additional trenching which reportedly extended the known length of the narrow Au-bearing structure to 800 metres. ELDORADO MINERALS, at the Eureka group on Ursus River optioned from prospector Sam Craig, reported assays up to 10.6 grams of gold per tonne across 6 metres with shorter sections up to 57 grams of gold per tonne. At the TAY GROUP on Taylor River (77), GLADIATOR RESOURCES and BOWES LYON RESOURCES drilled several long, shallow-angle holes into a vertical

silicified breccia zone. NORANDA EXPLORATION performed surface mapping, surveys, and trenching on a large number of their properties in all parts of Vancouver Island, as part of a comprehensive gold search, including geochemical evaluation of their Angora property at Kennedy Lake and the Contented claims on Alberni Inlet. Several significant exploration projects are underway at widely-separated locations along the west coast of Vancouver Island from Ucluelet north to Zeballos and Port Alice. IRON RIVER RESOURCES LTD. have been encouraged by a geological review and re-sampling of the KALAPPA Au-Ag-Cu property on Meares Island (78) and are planning further work. AU RESOURCES are enthused about the results of geophysical, geochemical, and geological surveys of the AU claims on Flores Island (79). This company has reported soil geochemical results as high as 12,100 ppb gold and trench assays as high as 246 grams of gold per tonne and 809 grams of silver per tonne. At HESQUIAT LAKE (80), FLOW RESOURCES LTD. completed geological mapping, geophysical and geochemical surveys, trenching, and underground sampling on a large property which includes the Brown Jug Au-Ag-Zn-Pb showing. They drilled 13 holes, totalling 653.5 metres, and intersected a vein system in 8 of them with encouraging results, including a best intersection of 7.9 grams of gold per tonne, 72 grams of silver per tonne, and 4.35 percent zinc over 2.4 metres. FALCONBRIDGE LTD. drilled 5 holes at the HILLER property (81) on Toray Creek north of Zeballos following a program of ground geophysics, geochemistry, and minor trenching. Also at Zeballos, NEW PRIVATEER MINE LTD. are reported to be in the process of reopening and sampling underground workings at their mine and stockpiling ore with an average grade of approximately 13 grams of gold per tonne. At their Hart Lake property, southwest of Port Alice, BRINCO MINING LTD. report exploration including geophysics, geochemistry, and a small number of short drill holes. TERITON RESOURCES LTD., working on Teeta Creek 4 kilometres southwest of Port Alice, have published reports of extensive Au-As-Zn anomalies in soils associated with a prospect previously known as a Cu-Mo system.

BETTER RESOURCES drilled 15 short holes at MT. WASHINGTON (82) which demonstrated some continuity to the gold mineralization in sub-horizontal fractures west of the zones previously mined for copper. This new gold mineralization, discovered in 1983, occurs in a gold-arsenic geochemical anomaly at least 760 metres long containing gold in soils up to 6,200 ppb. In addition to the drilling, they continued geochemical sampling over the entire Mt. Washington area. This new look at an old property shows strong promise for extensive epithermal gold mineralization associated with a prominent Tertiary volcanic centre. West of Mt. Washington, at Piggott Creek, IRON RIVER RESOURCES carried out a small sampling and drilling program on the Elnora claims searching for bedrock gold.

In the ADAM RIVER-WHITE RIVER area south of Sayward, FALCONBRIDGE LTD. carried out an airborne geophysical survey with ground geophysical, geochemical, and geological follow-up work on the BRUNO GROUP (83) optioned from Canamin Resources. This work led to more staking by both Falconbridge and Canamin and a small drill program on the Davis copper showing. FALCONBRIDGE LTD. also drilled 370 metres in 3 holes on their Nimpkish Au-Ag-Zn prospect at NIMPKISH LAKE (84).

At Sombrio Point, 100 kilometres west of Victoria, NUSPAR RESOURCES have been constructing a pilot mill to test a new cyclone system of fine gold separation but no further bulk sampling or other geological evaluation has taken place in 1984.

Notices of Work

The numbers of Notices of Work filed to date in 1984 are:

Mineral	-	111	(139)
Placer	-	12	(20)
Coal	-	0	(1)

The numbers in brackets are the corresponding totals for 1983 and it can be seen that there is a significant decrease in all categories.

DEVELOPMENTS

There are no new mines under active development in the southwest district in 1984, with the exception of the H-W MINE at Westmin's Myra Creek Operations (described in the next section).

QUINSAM COAL LTD.'s proposed 1 million tonne per year thermal coal open pit development southwest of Campbell River is on hold pending improved markets. The small WOLF MOUNTAIN coal development near Nanaimo has suspended operations pending technical improvements in product beneficiation. The proposed gold mine of OSPREY MINING AND EXPLORATION on Ashlu Creek northwest of Squamish is also on hold while limited exploration drilling continues. In all cases, the necessary permits and approvals to proceed have been granted.

PRODUCERS

Production continues at the MYRA and LYNX mines (95) of WESTMIN RESOURCES at Buttle Lake following settlement of a 4 1/2 month strike in March. Ongoing exploration drilling continues to marginally extend the known reserves of the operating Lynx mine.

The strike delayed completion of development of the new H-W MINE and the new mill. Production from the H-W and processing of ore through the new 2 700 tonne per day mill are now expected sometime in 1985. Current published reserves of the H-W orebody are 13.8 million tonnes averaging 2.4 grams of gold per tonne, 37.7 grams of silver per tonne, 2.2 percent copper, 0.3 percent lead, and 5.3 percent zinc. The orebody is still not fully defined so exploration is continuing.

The ISLAND COPPER MINE (96) of UTAH MINES, 16 kilometres south of Port Hardy, continued to operate through 1984. An underground decline has been completed which connects the lower part of the pit directly to the mill and a conveyor belt has been installed. When operational, the conveyor will

transport broken ore from the pit to the mill and the truck fleet will be phased out. Utah Mines continued their on-property exploration for new reserves with systematic geophysical, geological, and geochemical studies and a combined diamond drilling and percussion drilling program in 1984.

PHOTO 6 - Open pit, Island Copper Mine, currently operating at 40 000 tonnes per day. Initial reserves 257 million tonnes grading 0.52 percent Cu, 0.017 percent Mo, plus precious metal and rhenium credits

At the LADNER CREEK MINE (97) of CAROLIN MINES northeast of Hope, no underground mining is taking place at the end of 1984. None of the remaining probable ore reserves, estimated about 726 000 tonnes at 4.5 grams of gold per tonne, have been developed to a stage where they can be mined. However, an attempt is being made to convert the mill to an all-flotation process, avoiding further use of cyanide, and to reprocess the tailings with an expected recovery of about 2 645 grams of gold per day from the tailings. Some surface drilling is planned to attempt to extend reserves.

SOUTH CENTRAL DISTRICT

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INTRODUCTION

The anticipated rush of exploration in the Adams Lake area due to the Hilton discovery late in 1983 did not materialize. Using the number of Notices of Work on a Mineral Claim, Form 9-10, as an index, exploration activity for metallic and non-metallic minerals was down by 7 percent (188 filed vs. 203) and recorded placer activity was down by 18 percent (94 filed vs. 114) from 1983 levels. Exploration expenditures appear to have decreased by a similar proportion, at least.

MINERAL EXPLORATION

CORPORATION FALCONBRIDGE COPPER carried out a systematic exploration program on the HILTON-REA GOLD (98) massive sulphide property located 98 kilometres northeast of Kamloops. Geological mapping, geochemistry, geophysics, trenching and diamond drilling of 17 holes totalling 1800 metres was completed in 1984 and helped outline 120 000 tonnes grading 18.2 grams gold per tonne, 141.2 grams silver per tonne, 0.85 percent copper, 4.11 percent zinc and 3.67 percent lead. The massive sulphides occur in at least two lenses at the same stratigraphic level in altered mafic pyroclastics; the sulphides were deposited near the end of volcanic activity in a unit of the Eagle Bay Formation of possible Devonian or older age. A similar geologic environment is present on the adjacent APEX-TWIN (99) property to the east and on the BAR claims (100) to the west, and Corporation Falconbridge Copper have extended their exploration efforts to these two properties. A detailed geologic mapping program was also completed by CORPORATION FALCONBRIDGE COPPER on the MT. ARMOUR (101) claims immediately east of Barriere. Massive sulphide potential exists at this site as well, and drilling may be carried out in the future.

On ADAMS PLATEAU, PLAYER PETROLEUM have uncovered a new massive sulphide showing on the WAD claims(102). Fine grained pyrrhotite, pyrite-sphalerite, chalcopyrite and galena occur as stratiform laminae or as fine grained sulphide dissemination in a fine grained siliceous rock. ADAMS SILVER carried out extensive trenching and 623 metres of diamond drilling in 10 holes on the old LUCKY COON group (103). A 1 300 metre strike length of potential mineralization is reported, 325 metres of which is interpreted by Adams Silver to be of massive sulphide character.

WESTMIN drilled 1 100 metres on the BECA claims (104) on the east side of Adams Lake where one metre wide stratiform bands of galena and sphalerite are found in a volcanogenic setting of altered rhyolitic tuffs and andesitic pyroclastics.

The TOP claims (105) near Falkland, currently under option to BRICAN RESOURCES of Vernon, were earlier mapped and drilled by Craigmont and Canamax. This copper and silver showing is hosted in a sequence of augite porphyry breccias with interbedded altered tuffs and flows which had been mapped as Tertiary but are probably Devonian in age. By means of several backhoe trenches excavated across the strike of the formation, Brican have outlined copper-silver mineralization in altered, brecciated zones within the volcanic breccias, measuring 3 to 4 metres in width and spaced approximately 30 metres apart.

The ALLIES COPPER property (106) on Watching Creek north of Kamloops was explored by LARAMIDE RESOURCES. Gold is found in felsite porphyry dykes of possible Tertiary age.

MINEQUEST explored for gold on the PRECISELY CLAIMS (107) east of Vidette Lake and carried out a percussion drilling program on the MARA claims (108) northwest of Kamloops, again searching for gold. On the Mara claims 735 metres were drilled in 9 holes. RAMPART MINES explored on SILVER QUEEN (109) lead-zinc-silver prospect in the Stein River valley northwest of Lytton where mineralized veins associated with Coast intrusions cut metasedimentary and metavolcanic rocks. HUDSON BAY EXPLORATIONS prospected along the Nahatlatch River, where gold is found along ultramafite-intrusive contacts.

ESSO MINERALS re-examined the DUSTY MAC (110) property where in 1975 and 1976 Dusty Mac Mines Ltd. open-mined approximately 89 000 tonnes of ore grading 8 grams of gold and 160 grams of silver per tonne from a sequence of felsic pyroclastics, lahar, and lake and stream sediments of Tertiary age. PLACER DEVELOPMENT carried out geological and geochemical surveys on the GOOD HOPE and CANTY properties (111) in the Hedley area where gold ore from a skarn assemblage developed along a limestone-tuff contact was mined and milled at the nearby Dankoe mill in recent years. CANADIAN NICKEL carried out a grassroots exploration program, based on the Nevada epithermal gold model at the REN/KAM (119) claims north of the west end of Kamloops Lake. NORANDA continued work on the SHERPA-REBAR claims (112) optioned from prospector John Leask, east of Mable Lake. Seven diamond drill holes totalling 909 metres were completed proving the existence in place of stratiform sphalerite mineralization in a marble-quartzite sequence. NORANDA was also active on the MX2 claims (113) north of the REA-HILTON showing in October where it completed a small diamond drill program searching for massive sulphides. NORTHAIR MINES have announced an exploration program on the MOW claims (114) east of and along Deadman Creek, north of Savona, where Triassic andesite breccias host cuprite, native copper and chalcopyrite. Listwanite and riebeckite occur in quartz-eye rhyolite on this property.

drilling in 30 holes on the J&L (115) property north of Revelstoke, described as a gold bearing, arsenopyrite-pyrite-quartz Sedex type deposit hosted in a psammite with carbonate lenses.

BANBURY GOLD MINES (116) southwest of Hedley, continued drilling for gold in veins cutting upper Triassic metasediments and/or diorite. Intersections grading 26.9 grams of gold per tonne across 3 metres have been reported. A gold heap leaching facility has been shutdown until the spring.

MASCOT GOLD (117) carried out an intensive surface and underground exploration program searching for open-pittable gold mineralization at and near the old Hedley Mascot Mine northwest of Hedley. Late in the season as many as 11 drills and a crew of 80 to 90 men were operating on the property at one time. Details of this program were not available at the time of writing. From 1897 to 1955 the Hedley Mascot Mine produced 1 314 013 tonnes of ore grading 15.08 grams of gold per tonne.

BRALORNE MINE (118) located near Gold Bridge reports encouraging results from surface drilling. Operations will be suspended during the winter period.

PRODUCERS

LORNEX, VALLEY COPPER and AFTON MINES continued normal operations during the year. There is no indication that VALLEY COPPER'S intended expansion will be carried out in the near future. HIGHMONT MINE closed October 19 and GOLDSTREAM MINE north of Revelstoke closed in April. SIMILKAMEEN MINE continues to operate; BRENDA MINES re-opened May 28 but closed again for an indefinite period in October.

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INTRODUCTION

As indicated by the number of Notice of Work on a Mineral Claim, Form 9-10 filed, there has been a 23 per cent decrease of mining activity in the Nelson area. Two districts, Golden and Fort Steele have an increase of mining exploration of 14 and 8 percent respectively. The two mining districts of Slocan and Nelson, which usually have nearly the same level of activity, now have decreases of 30 percent and 17 percent. This is assumed to be due to relatively low precious metal prices, and lack of funding.

TABLE 6
LEVEL OF ACTIVITY
DERIVED FROM NOTICES OF WORK ON A MINERAL CLAIM, FORM 9-10

	1983 (Dec 15)	1984 (Nov 1)	Increase/Decrease
Ainsworth	8	4	-50%
Fort Steele	25	27	+ 8%
Golden	14	16	+14%
Grand Forks	32	18	-44%
Lardeau/Revelstoke	26	10	-62%
Nelson	66	55	-17%
Rossland	7	3	-57%
Slocan	61	43	-30%
Placer	49	46	- 6%
TOTAL	290	222	-23%

Activity in the West Kootenay District continues to be focused on precious metals, with new finds being reported in the TILLICUM MOUNTAIN, AINSWORTH MINING CAMP, and the BOUNDARY MINING CAMP areas. Significant large precious metal deposits are being explored by HP/Selco Inc. together with Riocanex Inc. at Aylwin Creek, Kettle River Resources/Noranda at the Sylvester K deposit near Greenwood, and by Esperanza/La Teko in the Tillicum Mountain area, on the East Ridge Zone (Au), the Silver Queen Zone (Ag), and the new Arnie Flats zone (Ag).

EXPLORATION

Minerals

In the TILLICUM MOUNTAIN area ESPERANZA EXPLORATION LTD. have found new mineralization on their TILLICUM MOUNTAIN PROPERTY (120) east of Burton. A new silver mineralized zone called "SILVER JACK" was discovered on "ARNIE FLATS". This zone is 200 metres long, 6 metres wide, with grades in the order of 171 grams of silver per tonne and 0.68 grams of gold per tonne, as well as some zinc and copper values. Twelve diamond drill holes were also completed on the Silver Queen Zone which is more than 610 metres long and approximately 6 metres wide. Reserves are considered to be 3-5 million tonnes grading approximately 103 grams of silver per tonne. Four diamond drill holes were completed on the East Ridge Gold Zone increasing the down dip extension of the surface showing to 60 metres and the strike length to 600 metres. The width of the mineralized zone is up to 30 metres. Reserves are inferred to be 4.5 million tonnes grading 1.71 grams of gold per tonne. The Heino vein 2 165 metre level drift indicates an ore zone 8 metres long with muck samples grading 31.88 grams of gold per tonne. Prospector ALEX STREBCHUK has located gold in place on his CARIBOU CLAIMS (121) on nearby Hailstorm Mountain. The geology is believed to be similar to Esperanza's Silver Queen Zone at Tillicum Mountain. A bedrock assay taken by Esperanza yielded 5.34 grams of gold per tonne. Free gold is found in the soil.

In the AINSWORTH MINING CAMP a significant new find has been made by E.H. HELGREN and JAMES KENNEDY who have a new Ag-Pb-Zn vein at WHEELER LAKE (122) west of Ainsworth. The vein structure is reported to be 150 metres long and .3 to 1.5 metres wide. A grab sample yielded 480 grams of silver per tonne.

In the BOUNDARY MINING CAMP, CONSOLIDATED BOUNDARY EXPLORATION and GRAND FORKS MINES LTD. have drilled a significant hole at the WINNIPEG MINE (123). Massive sulphides were encountered which are reported to have yielded good gold values. Other drilling has been conducted on the Crown, Golden Crown Hole and Prominent properties. Total drilling exceeds 2 400 metres. KETTLE RIVER RESOURCES continued work near Greenwood on the properties joint ventured with NORANDA EXPLORATION COMPANY LTD., particularly SYLVESTER K (124). Work done included four diamond drill holes totalling 290 metres, airborne and ground geophysics, geochemistry, and detailed geological mapping. A similar program is planned for 1985. Large precious metal deposits continue to be explored.

PHOTO 7 - Sylvester K Deposit. Siltite beds in massive sulphides. Drill indicated reserves 45 to 90 000 tonnes grading 2.05 grams of gold per tonne.

On the SKYLARK CLAIM (128) east of Greenwood, SKYLARK RESOURCES and VISCOUNT RESOURCES LTD. have a new silver bearing shear zone in granite that is 97 metres long, and 2.6 metres wide, and grades 198 grams of silver per tonne. Diamond drilling is in progress.

In the SLOCAN AREA, the BP/SELCO RIOCANEX INC. joint venture drilled 17 short holes totalling 550 metres on their AYLWIN CREEK (125) gold prospect. A new evaluation of the geology and grade of the deposit is in progress. BP/SELCO INC. also have an option from Esperanza Ltd. on the WISCONSIN GOLD MINE (126) on Midge Creek, east of Nelson. Eight diamond drill holes for a total footage of 1 163 metres were drilled. All intersected mineralization.

Between KASLO and NEW DENVER, on the RED DIAMOND CLAIM (127) located at the headwaters of 10 Mile Creek, RED DIAMOND MINES LTD. diamond drilled a vein traced on surface for 25 metres which has yielded assays of 5.82 grams of gold per tonne across one metre. Surface assays were 275 grams of silver per tonne, 0.06 grams of gold per tonne, 12 percent copper, 5.87 percent lead and 7.23 percent zinc. Another vein has been found on surface which assayed 857 grams of silver per tonne.

Near Mt. Abbot in the LARDEAU, BANNOCKBURN RESOURCES have done considerable geological work on the RED ELEPHANT ZONE (129) (Bannockburn claims). A one to two metre wide zone 130 metres long, assays 0.30 to 43.26 grams of gold per tonne. Another 10 centimetre wide quartz vein sub-parallels this zone and has assays of 12.3 to 61.7 grams of gold per tonne.

NORAMEX MINERALS INC. drilled the ROOT (130) gold property near NELSON to test a stratabound gold deposit 3 to 6 metres wide, 110 metres long. Surface assays reported are between 0.20 and 34.28 grams of gold per tonne. The zone is open in both directions.

CT EXPLORANDA and NU DAWN RESOURCES INC. did a geochemical survey, trenching and diamond drilling on the YMIR GOODENOUGH (131) property near YMIR. Strong gold geochemical anomalies were found, but trenching did not reach bedrock. Quartz float has been found which assayed 8.9 to 353.9 grams of gold per tonne and 31 to 34 grams of silver per tonne, but the source has not been identified.

GOLDTECK RESOURCES INC. and TUNSTALL RESOURCES INC. examined the LASKA CLAIMS (132) at the headwaters of LASKA CREEK, 16 kilometres east of Nelson. The best grab sample assayed 977.3 grams of gold and 62.7 grams of silver per tonne and 0.75 percent lead.

SEARAY OIL LTD. drilled 105 metres on their ALPINE CLAIMS (133) on FINDLAY CREEK, west of Canal Flats. Zinc-copper mineralization has been encountered near the Creston/Aldridge contact for more than 240 metres of strike length.

SIPALD RESOURCES has given an option to Newmont Exploration of Canada Ltd. on their tungsten showing near Healy, north of Duncan Lake. One high grade showing is a replacement in limestone adjacent to a mineralized quartz vein.

Prospector TOM CHERRY, shipped 49 tonnes of gold ore to Cominco from the REFERENDUM MINE (134) near Nelson. The first 21 tonnes assayed 6.96 grams of gold and 6.85 grams of silver per tonne. The visible gold is associated with a small amount of stibnite. An adjacent claim ("TECGOLD") has visible gold associated with bornite in a quartz vein. Both properties receive silica credits on their shipments.

Placer

WARSTAR and KMS RESOURCES INC. report that their pay zone on MOYIE RIVER (137) near Cranbrook has been traced for over 1 000 metres, with a thickness of 2.4 metres and a width of 30 metres. BRITEX RESOURCES LTD. (Arthur L. Davis) has done considerable churn drilling at the junction of GAINER CREEK (136) with the Lardeau River.

DEVELOPMENTS

DICKENSON MINE/SILVANA DIVISION (137) have discovered and been very successful in developing new silver ore at Sandon. The zone is more than 90 metres long, and continuous for more than 60 metres down dip. Grades are up to 1 560 grams of silver per tonne, 4.4 percent lead and 17.5 percent zinc. Native silver is also present in this ore which is reported to be the best ever seen in the mine. It is estimated that at least three years' reserves have been found, and exploration is continuing.

SKAGIT MINING LTD. have discovered and have been successful in developing new silver ore at the LITTLE TIM (138) mine near Sandon. Some spectacular native silver ore has been located and exploration continues. One grab sample assayed 17 140 grams of silver per tonne.

DENTONIA RESOURCES LTD. and JAMES U. BLANCHARD & CO INC. have developed new ore at the DENTONIA MINE (139) near Jewel Lake, north of Greenwood. On the 400 level an ore shoot 21.6 metres long, 1.3 metres wide, assaying 19.88 grams of gold per tonne and 135 grams of silver per tonne has been located. Ore grade material was also located on the 75 level. New development work commenced at the beginning of November.

PRODUCERS

Normal production continued at Cominco's SULLIVAN MINE (Ag, Pb, Zn, Cd), at Kimberley, at DICKENSON MINE (Ag) at Sandon at 100 tonnes per day, at Skagit's LITTLE TIM MINE (Ag) at 25-50 tonnes per day, and the NUGGET MINE (Au) at Sheep Creek. Teck Corporation's HIGHLAND BELL MINE (Ag) continued operating at 100 tonnes per day, with a production for their fiscal year, ending in September, of 36 287 tonnes of ore, yielding 12 855 000 grams of silver.

Nine small mines closed during the year. These are: NO.1 and CHAMBERS MINES (Ag, Pb, Zn) of Knie Resources, BAYONNE MINE (Au) of Goldrich Resources, HOWARD-DURANGO MINE (Au), WHITEWATER MINES (Au), REFERENDUM MINES (Au), BLACK PRINCE and TWO FRIENDS (Ag), HALLMAC MINE (Ag), and NUGGET MINE (Au, Silica).

PHOTO 8 - Portal Bayonne Mine (Au) of Goldrich Resources, recently closed.

INDUSTRIAL MINERALS
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INTRODUCTION

The non-metallic segment of the British Columbia mineral industry enjoyed an improved climate for operations in 1984 as compared to the previous year. Many companies produced on a larger scale than in 1983 and several new operations were started.

ASBESTOS

At the CASSIAR ASBESTOS MINE (Figure 6) (1), one deep drill hole totalling 622.4 metres completed by BRINCO MINING LTD. is reported to have intersected 150 metres of "asbestos-bearing serpentinite with asbestos content similar to the Cassiar orebody" believed to be the southwest extension of McDame orebody discovered several years ago by underground work. The drilling program that followed this earlier discovery indicated a potential of at least 15 million tonnes of asbestos ore. The 1984 intersection has significantly extended the indicated underground reserves.

BARITE

The PARSON (2) deposit of MOUNTAIN MINERALS LTD. is now operating permanently at a few thousand tonnes a month. The company is now the sole operator on the site since Canadian Mining Services went into receivership earlier this year. Also, a successful underground drilling program has outlined additional reserves at Brisco. The SILVER GIANT (3) processing facility of BAROID was inactive, since both tailings and stockpile are depleted. FENWAY RESOURCES, the successor of Bar-Well Resources, engaged only in bulk sampling and laboratory studies of material from the MOUNT PEDLEY (4) deposit.

New developments

MAGCOBAR DIVISION of Dresser Industries started production from the FIRESIDE deposit on kilometre 588 of the Alaska Highway. By mid-August approximately 15 000 tonnes had been mined from the vein system, and approximately 10 000 tonnes had been shipped to Watson Lake for milling.

BERYL

New developments

BEARCAT EXPLORATION announced a $350,000 program for exploration of the Hellroaring Creek (26) pegmatite deposit. Earlier work done 20 years ago indicated 500 000 tonnes of ore averaging 1 percent BeO.

BUILDING STONE

In REVELSTOKE (7) and in SALMO (6) the flagstone production is at about the same level as in 1983 - a few thousand tonnes per year.

New developments

A second quarry near REVELSTOKE started to produce the local mica schist for flagstone and facing stone applications. CANROC INTERNATIONAL CORPORATION started the processing of stone blocks in its new finishing plant in DELTA.

This is a custom finishing operation which processes only granite blocks from South Dakota for a Seattle construction project. The quartzite quarry site in the Rocky Mountains (8) was inactive in 1984.

DIATOMITE

The QUESNEL deposit (13) continues to produce on a small scale the local impure diatomaceous earth for its traditional line of absorbents and lightweight aggregate.

New developments

CLAYBURN INDUSTRIES of Abbotsford are processing the Quesnel diatomite into speciality insulating and refractory brick for the aluminum industry. The Abbotsford plant is undergoing a major expansion as a result of this successful R & D project. A similar low grade mixture of diatomite with fine-grained volcanic ash from RED LAKE (27) near Kamloops is also processed by D.E.M. RESOURCE PROCESSORS of Calgary into an absorbent product.

DIAMONDS

Bulk sampling and laboratory studies are reported by DIA MET MINERALS LTD. from their properties on LEUS MOUNTAIN and PANGMAN PEAK (25) near Golden. Of the several kimberlite pipes examined there, two were proven to carry diamonds.

FELDSPAR

GUILLET-KRIEUS-MORTON reports that a white feldspar pegmatite dyke near BLUE RIVER (29) was tested in 1984. Laboratory results indicate that good quality glass grade feldspar can be produced from this deposit. KAMROCK INDUSTRIES LTD. reported laboratory testing of feldspatic sand from SCUZZY CREEK (39).

FLUORSPAR

EAGLET MINES continued studies of its deposit on QUESNEL LAKE (14). This year the company concentrated on laboratory studies of the ore and environmental issues as a part of feasibility studies. The company is reporting 24 million tonnes averaging 11.5 percent CaF_2. The project has entered Stage 1 of the Metal Mines Guidelines Review Process.

GYPSUM

Operations continued at the WESTROC INDUSTRIES quarry near WINDERMERE (16) and LAFARGE CANADA quarry at FALKLAND (15).

New developments

DOMTAR INC. started production from its property on LUSSIER RIVER (17) in the Selkirk Mountains. The crusher and load-out facilities are being built at Canal Flats.

GEMSTONES

Jade

In the Kutcho Creek area, MOHAWK OIL CO. LTD. conducted an exploration program for nephrite jade on the JADEX property (40). The program included several short diamond drill holes on a number of jade outcroppings, boulder blasting and road maintenance. Approximately 45 tonnes of nephrite jade was shipped by air to Dease Lake from a stockpile on the Kutcho airstrip. A program of several short diamond drill holes and limited trenching is also reported by FAR NORTH JADE and JADE WORLD on OGDEN MTN. (18).

Rhodonite

New developments

Carving grade rhodonite appeared on the market in limited quantities this year from two different deposits, HILL 60 (41) on Cowichan Lake and ARTHUR POINT (42) south of Bella Coola.

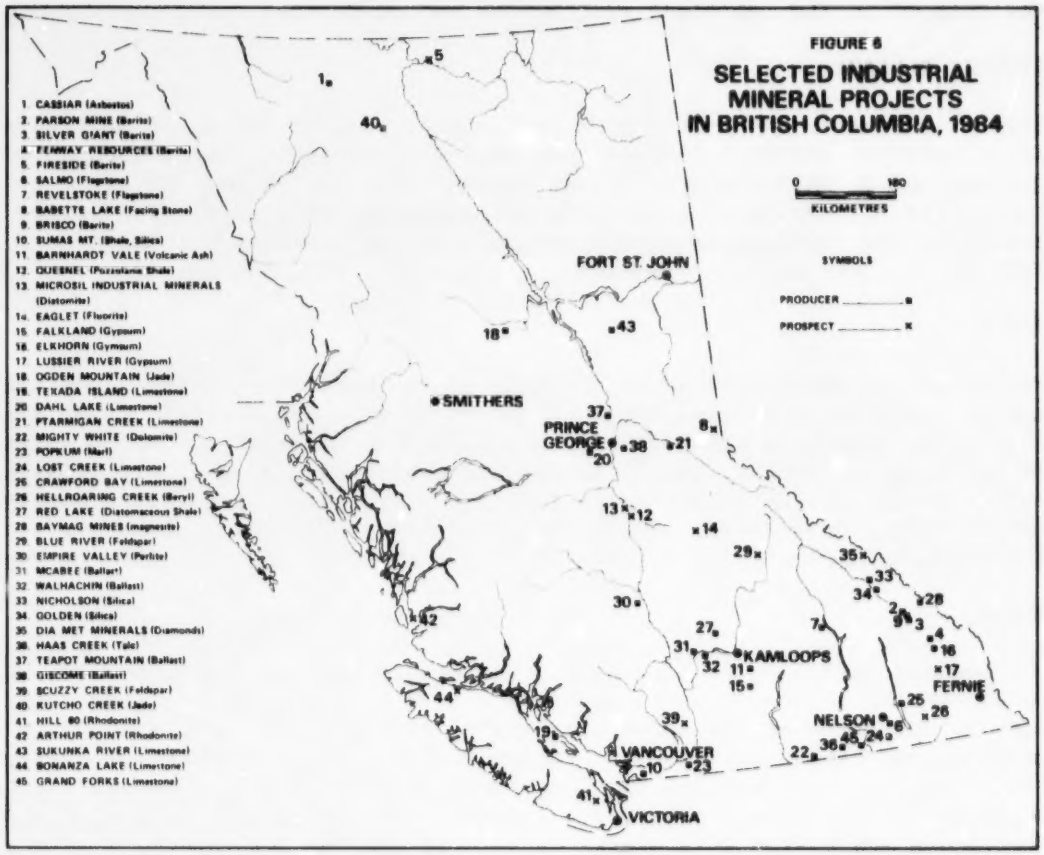
LIMESTONE

Four producers on TEXADA ISLAND (19) - OREGON PORTLAND CEMENT, IMPERIAL LIMESTONE, IDEAL ROCK PRODUCTS, and LAFARGE CANADA continue to operate on a reduced scale without significant changes. The LAFARGE CANADA cement plant in KAMLOOPS is expected to close later in 1984 because of the depressed cement market. During the summer the company engaged in a thorough reassessment of its resource base in British Columbia.

In the PRINCE GEORGE area, the DAHL LAKE quarry (20) was active only in late fall and the two other producers, TRI-LIME RESOURCES and WESTERN LIME AND MARBLE, were shut down because of financial difficulties. Agricultural lime and other crushed and sized products are produced by MIGHTY WHITE DOLOMITE LTD. of ROCK CREEK (22).

New developments

PRIME LIME AND MARBLE LTD. and WESTMIN RESOURCES LIMITED are preparing for agricultural lime production from their two new locations on SUKUNKA RIVER (43), 80 kilometres south of Chetwynd, more suitable located with respect to the potential Peace River market area. The Prime Lime quarry started to produce during October. IMASCO has prepared two new underground limestone quarries. One is in the BONANZA LAKE area (44) of Vancouver Island and the other is on LOST CREEK (24) south of Salmo. Both limestones are to be processed to a filler grade product. In Grand Forks, VTS QUARRY LTD. (45) started a small scale production of agricultural lime from locally quarried dolomite.



MAGNESITE

BAYMAG MINES CO. is steadily increasing production from its EON MOUNTAIN quarry (28). The 1984 production will be approximately 100 000 tonnes. Magnesite is processed in Exshaw, Alberta into refractory and chemical grade magnesia. Plans by the Mineral Processing Licensing Company of UK to use the same magnesite for production of metallic magnesium have not yet been finalized. The proposed plant location for this project is High River, Alberta.

PERLITE

New developments

AURUN MINES successfully processed a trial 1 000 tonne shipment mined from

the EMPIRE VALLEY area (30). At present the company is building an industrial scale processing facility in Surrey. This first year's production from the quarry is 1 100 tonnes, of which about half had already been shipped to the new plant site by the end of October.

RAILROAD BALLAST

Three major quarry operations produced several million tonnes of aggregate each. CANADIAN NATIONAL RAILWAYS operated the McABEE (31) and GISCOME (38) quarries and CP RAIL the quarry near WALHACHIN (32). 3M COMPANY of Minneapolis, Minnesota is investigating the possibility of manufacturing ceramic-coated roofing granules from the small size waste from these quarries.

RUTILE

The laboratory investigation of titanium in tailings of porphyry deposits in British Columbia, conducted during 1983 and 1984 by the BRITISH COLUMBIA MINISTRY OF ENERGY, MINES AND PETROLEUM RESOURCES, identified one potential source of this mineral. The EQUITY SILVER deposit south of Houston contains about 1 percent titania, mainly in the form of rutile. The other deposits studied were: Bell, Bethlehem, Brenda, Gibraltar, Granisle, Highmont, Island Copper, Lornex, Afton, Newmont, Boss Mountain, and Kitsault.

SILICA

The MOUNTAIN MINERALS CO. LTD. plant near GOLDEN (34) is continuing to process the local Mt. Wilson quartzite into glass grade silica sand. The plant is operating at full capacity. Total 1984 production of all silica grades is expected to reach 85 000 to 90 000 tonnes. The NICHOLSON quarry (33) of BERT MILLER TRUCKING AND CONTRACTING shipped 45 000 tonnes of quartzite to the Hanna Mining plant in Wanatchee, Washington. Some of the finer grade waste from this quarry is used by GENSTAR for cement manufacturing in its plants in Delta and Edmonton.

TALC

Ground talc for filler and dusting components in asphalt trades is produced in small quantities by IMASCO from the HAAS CREEK (36) deposit located west of Greenwood.

GOVERNMENT STUDIES

The RESOURCE DATA SECTION of the Ministry's Geological Branch compiled the basic file data on wollastonite occurrences in British Columbia and the essential data to study potential rock sources to manufacture ceramic-coated roofing granules.

A systematic study of reported carbonatite showings between Revelstoke and Germansen Landing was started this year by Jennifer Pell as part of a post-graduate research program at the University of British Columbia, supported and supervised by the Ministry.

GOVERNMENT FIELD ACTIVITIES

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Field activity in Geological Branch continued at a relatively low level during 1984 due to low operating funds and hiring restraints. Three of the eight Project Geologists, A. Panteleyev, B.N. Church and G. Ray, had significantly shortened or no field seasons; the length of time that the others had in the field was also limited by funding.

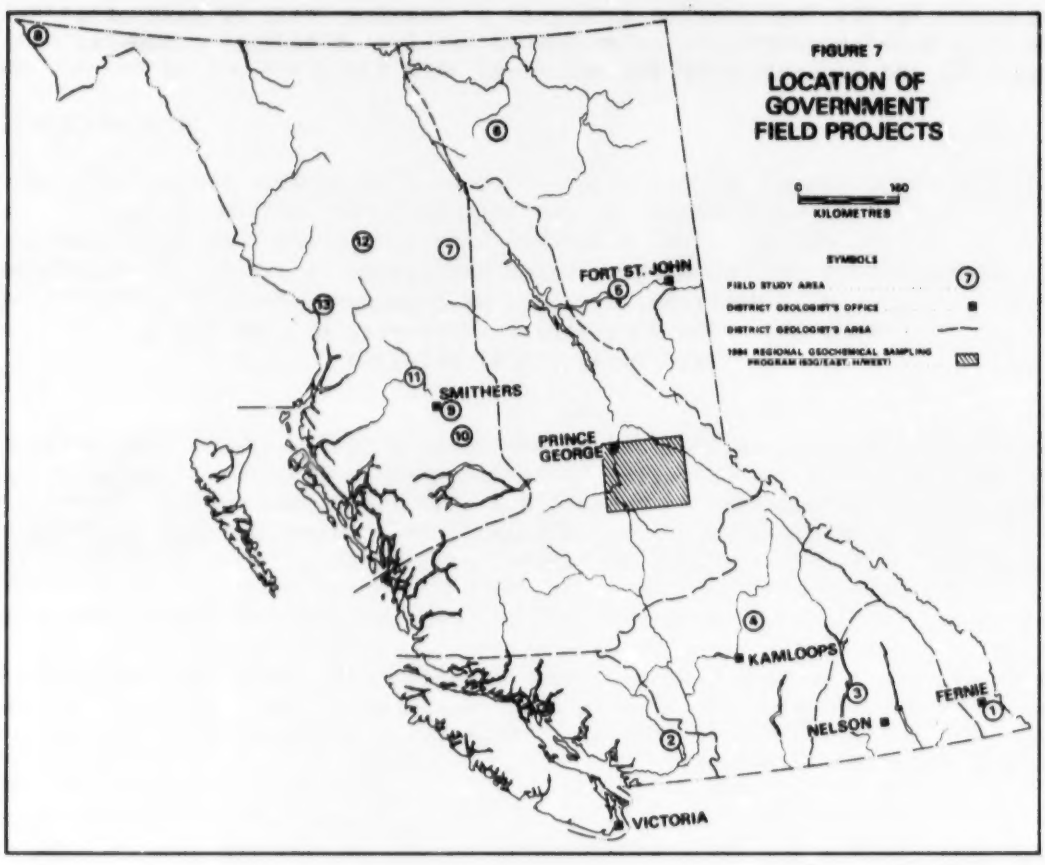
Most projects continue to concentrate on precious metal and massive sulphide potential, although a study of carbonatite occurrences with niobium, rare earth and other element potential was initiated (see Industrial Minerals report by Z.D. Hora). Activity in coal continued at the same level as last year with efforts in north central British Columbia focussed on the Mount Klappan anthracite deposit.

Results of projects conducted by the Branch are presented in the publication Geological Fieldwork, 1984, scheduled to be released at the joint Chamber of Mines-Government "Exploration Roundup" in Vancouver on January 23, 1985.

In the southeast coalfield, DAVID GRIEVE and WARD KILBY carried out a brief cooperative program to analyse the resource potential of part of the NORTHERN DOMINION COAL BLOCK (Figure 7) (1).

TRYGVE HOY initiated a regional metallogenic study in N.T.S. sheet 82, Kootenay River, in southeastern British Columbia. Fieldwork, in conjunction with Francoise Gautier, a PhD student at the University of B.C., concentrated on deposit studies in the Barriere-Clearwater area. Deposits in other areas examined included J & L, a stratabound gold-arsenic deposit; Rebar-Sherpa, a newly discovered Shuswap-type lead-zinc and lead sandstone deposit; and Rift, a massive lead-zinc deposit. Compilation of data to produce a metallogenic map of the Kootenay River sheet is well advanced.

GERRY RAY spent about a week in the Harrison Lake area re-examining and geochemical sampling in the DOCTOR'S POINT area (2), and mapping and sampling on Fire Mountain, about 40 kilometres to the northwest. Two old



gold mines, the Money Spinner and the Blue Lead, were examined. These areas may have massive sulphide potential. Gerry also spent four weeks mapping around the TILLICUM MOUNTAIN gold property (3). Ten square kilometres were completed at scale 1:5 000 and reconnnaisance traverses extended the coverage. Several periods of metamorphism and deformation, and the lack of persistent marker units hamper interpretations. Regionally, metal zoning occurs, from gold at Tillicum Mountain to silver at Arnie Flats and Silver Queen. The sampling that was done will enable geochemical analyses and interpretation.

GORDON WHITE in the south-central district, carried out a program of geological mapping around the recently discovered HILTON-REA GOLD (4) gold-silver-copper-lead-zinc massive sulphide deposit. The sulphides form two lenses in mafic pyroclastic host rocks that have been altered to sericite and chlorite schist.

In the Central District, TED FAULKNER conducted property visits to active hard rock prospects and placer operations, aided prospectors, and continued work on a teaching manual for prospecting classes. ANDRE PANTELEYEV plans to start a project to study mineral deposits in Mesozoic volcanic rocks in the Quesnel Gold-Copper belt in 1985.

In the northeast, ANDREW LEGUN and WARD KILBY continued their efforts to map and correlate coal measures and coal seams. Andrew worked mainly in WEST CARBON CREEK area; Ward mainly on regional correlation based on identification of altered volcanic ash layers (tonsteins and bentonites). These have now been identified in four formations and correlated for more than 100 kilometres. Results from chemical analyses and x-ray diffraction studies indicate that various tonstein layers are chemically and mineralogically distinguishable from one another; correlation between bore holes has been successful and structural repetition has been recognized. Attempts are underway to isotopically date these ash layers. A preliminary sedimentological study of the Upper Gething Formation along Peace River using numeric techniques was begun. Andrew also finished Preliminary Map #57 for the BUTLER RIDGE area (5) and completed field studies in the WOKKPASH PARK PROPOSAL AREA (6), including a stream geochemical survey.

In the Northwest District, LARRY DIAKOW completed the field component of a joint study of mineral deposits and stratigraphy in the TOODOGGONE area (7). He, ANDRE PANTELEYEV, and TOM SCHROETER are preparing a preliminary geological map for release early in 1985. SCHROETER and PANTELEYEV are also nearing completion of a compilation map of all significant precious metal deposits in the Province which is scheduled for release in late spring, 1985.

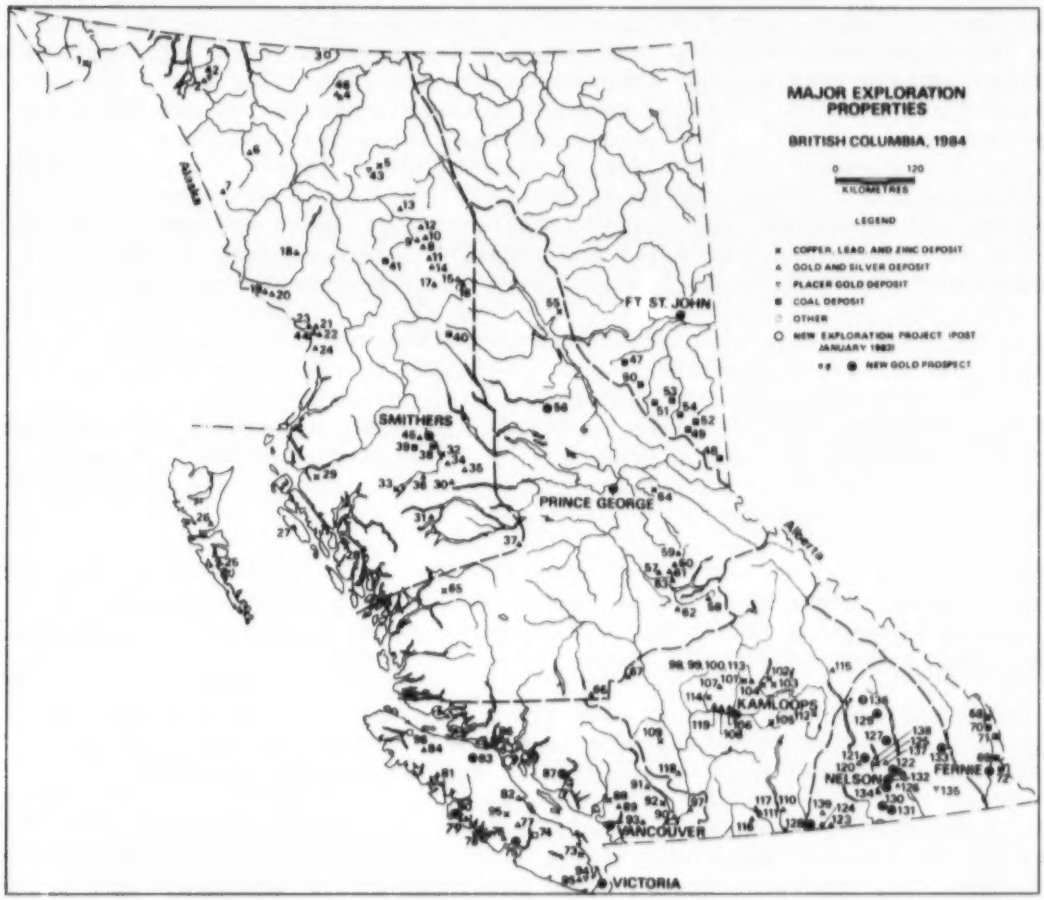
Further work by DON MACINTYRE and TOM SCHROETER in the TATSHENSHINI area (8) focussed on prospects being tested in the Mount Henry Clay area. The stratigraphic setting is similar but deposits are mineralogically different from those in the Windy-Craggy area.

DON MACINTYRE, with the help of GARY WHITE from Smithers, also mapped the 50 square kilometre DOME MOUNTAIN gold camp (9) at scale 1:10 000. All major showings were sampled for fluid inclusion and geochemical analysis.

NEIL CHURCH briefly examined a 25 square kilometre area immediately northeast of Houston, northwest of Burns Lake, at EQUITY SILVER MINE and at BOB CREEK (10). The work tested ideas developed on the existence of a major caldera in the area that may have controlled or localized mineralization.

Both JAHAK KOO and GARY WHITE worked on coal deposits in the Northwest District. Gary examined outcrops and drill core from the SEELEY LAKE prospect (11); Jahak spent a week with Gary at Seeley Lake but also mapped 250 square kilometres to cover the principal parts of the MOUNT KLAPPAN area (12). In total, 76 major stratigraphic sections were completed. With some 20 hours of helicopter time used, this was the most costly program run during the field season.

In the always active STEWART region, DANI ALLDRICK completed 50 square kilometres of mainly detailed fill-in mapping in the SALMON RIVER area (13). A mineralized zoning occurs, with shallow silver intermediate depth gold-silver, and deeper gold deposits. Field work on this project is completed; laboratory follow-up will include studies of ore minerals and alteration, and extensive isotopic dating.



1. TSIRKU–JARVIS GLACIER (Mt. Henry Clay) (Cu, Ag, Au, Co, Zn)
2. SHUSKAN, GV (Au, Ag)
3. MIDWAY (Ag, Pb, Zn)
4. ERICKSON GOLD (Au, Ag)
5. KUTCHO CREEK (Cu, Zn, Ag)
6. HEART PEAKS (Ag, Au)
7. MUDDY LAKE (Au, Ag)
8. LAWYERS (Au, Ag)
9. AL (Au, Ag)
10. JD (Au, Ag)
11. SHAS (Au, Ag)
12. GOLDEN LION (Ag, Pb, Zn, Cu, Au)
13. BILL (Au, Ag)
14. RON (Cu, Ag, Au)
15. GERLE GOLD (Au)
16. RED (Cu, Au, Mo)
17. ASITKA (Au)
18. HANK (Au, Ag)
19. REG (Au, Cu, Ag, Pb, Zn)
20. INEL (Ag, Zn, Cu)
21. BIG MISSOURI (Au, Ag)
22. SILBAK PREMIER (Au, Ag)
23. SUMMIT (Au, Ag)
24. PROSPERITY–PORTER IDAHO (Ag, Pb, Zn)
25. APRIL (Au, Ag)
26. Y5 to Y7 (Au, Ag)
27. YELLOW GIANT (Au)
28. HUNTER (Au)
29. SCOTIA (Zn)
30. IRK (Ag, Cu)
31. OX–C, OX–EAST (Ag, Cu, Au)
32. COPPERHILL (An, Cu, Ag)
33. NEW MOON (Cu, Ag)
34. BOB CREEK (Ag, Au, Zn, Pb)
35. EQUITY SILVER MINE (Ag, Cu, Sb, Au)
36. SILVER RED (Cu, Ag)
37. CAPOOSE (Ag, Cu, Au, Pb, Zn)
38. TELKWA (Coal)
39. ZYMOETZ (Coal)
40. SUSTUT (Coal)
41. KLAPPAN (Coal)
42. DAN–DRAIN (Placer Gold)
43. WHEATON CREEK (Placer Gold)
44. SCOTTIE GOLD MINE (Au)
45. DUTHIE MINE (Au, Ag, Pb, Zn, Cu, Cd)
46. TAURUS MINE (Au, Ag)
47. PINE PASS–WILLOW CREEK (Coal)
48. NORTH SECUS (Coal)
49. ONION LAKE (Coal)
50. WINDFALL (Coal)
51. WOLVERINE (Coal)
52. MONKMAN (Coal)
53. McCONKEY (Coal)
54. BABCOCK (Coal)
55. ALEY (Pb, Zn, Ag)
56. HEIDI (Au, Cu)
57. QR (Au)
58. FRASERGOLD (Au)
59. CARIBOO HUDSON (Au)
60. ROUNDTOP MOUNTAIN (Au)
61. YANKS PEAK (Au)
62. MEGABUCK (Au, Cu)
63. SPANISH LAKE (Au)
64. NOOK (Cu, Au)
65. NIFTI (Pb, Zn, Ag)
66. TAYLOR WINDFALL, SPOKANE (Cu, Au)
67. BLACKDOME MOUNTAIN (Au, Ag)
68. FORDING (Coal)
69. BALMER (Coal)
70. GREENHILLS (Coal)
71. LIME CREEK (Coal)
72. COAL MOUNTAIN (Coal)
73. MT. SICKER (Cu, Zn, Zu, Ag)
74. THISTLE (Cu, Au, Ag)
75. WICK (Au)
76. UNITED TOMMY (Au, Ag, Cu)
77. TAY (Au)
78. KALAPPA (Au, Ag, Cu)
79. AU, FLORES ISLAND (Cu, Ag)
80. HESQUIAT LAKE (Au, Ag, Zn, Pb)
81. ZEBALLOS (Au)
82. MT. WASHINGTON (Au, Ag, Cu)
83. BRUNO (Au, Ag, Cu)
84. NIMPKISH (Au, Ag, Zn)
85. VALENTINE MTN. (Au, Ag)
86. DORATHA MORTON (Au)
87. SKWIM LAKE (Au, Ag, Zn, Cu)
88. BRITANNIA (Cu, Zn, Au, Ag)
89. MAGGIE MINES (Au, Ag, Cu, Zn)
90. RN MINE (Au)
91. DOCTORS POINT (Au, Ag)
92. BIGFOOT (Cu, Zn, Au, Ag)
93. SKY (Au)
94. LEECHTOWN PLACERS (Au)
95. MYRA FALLS (Au, Ag, Cu, Pb, Zn)
96. ISLAND COPPER (Cu, Mo, Au)
97. CAROLIN MINE (Au)
98. REA GOLD (Au, Ag, Cu, Pb, Zn)
99. APEX–TWIN (Au)
100. BAR (Au, Ag, Cu, Pb, Zn)
101. MT. ARMOUR (Cu, Pb, Zn)
102. WAD (Cu, Pb, Zn)
103. LUCKY COON (Pb, Zn, Ag)
104. BECA (Pb, Zn)
105. TOP (Cu, Ag)
106. ALLIES COPPER (Au)
107. PRECISELY (Au)
108. MARA (Au)
109. SILVER QUEEN (Pb, Zn, Ag)
110. DUSTY MAC (Au)
111. GOOD HOPE, CANTY (Au)
112. SHERPA–REBAR (Zn, Pb)
113. MX2 (Cu, Pb, Zn)
114. MOW (Cu, Ag, Au)
115. J & L (Au)
116. BANBURY MINES (Au)
117. MASCOT GOLD (Au)
118. BRALORNE MINE (Au)
119. REN–KAM (Au)
120. TILLICUM MOUNTAIN (Ag, Au)
121. CARIBOU (Au)
122. WHEELER LAKE (Ag)
123. WINNIPEG (Au)
124. SYLVESTER K (Au)
125. AYLWIN CREEK (Cu, Au, Ag, Mo)
126. WISCONSIN (Au)
127. RED DIAMOND (Au, Ag)
128. SKYLARK (Ag)
129. RED ELEPHANT (Au)
130. ROOT (Au)
131. YMIR GOODENOUGH (Au, Ag)
132. LASKA (Au, Ag)
133. ALPINE (Zn, Cu)
134. REFERENDUM (Au, Ag)
135. MOYIE RIVER PLACER (Au)
136. GAINER CREEK PLACER (Au)
137. DICKENSON MINE (Ag, Pb, Zn)
138. LITTLE TIM (Ag)
139. DENTONIA (Au, Ag)